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A Malabo Montpellier Panel Report 2024



YOUTH AHEAD:

Policy Innovations to Create Opportunities for Young People in Africa's Agrifood Systems

ACKNOWLEDGEMENTS

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FOREWORD

Approximately ten years ago, the Malabo Montpellier Panel published a report on entrepreneurship in Africa's agriculture sector, which stressed the opportunities that are awaiting Africa's young people in the agrifood sector and which delved into the actions that governments must take to help small agribusinesses grow and prosper (Agriculture for Impact 2014). Since then, we addressed the challenges and opportunities of Africa's growing youth population in all our reports as an important crosscutting policy issue.

With a sense of urgency, we now revisit the status of young people in Africa's agrifood systems to propose further actions to put youth at the center of food systems transformation and reflect on policy opportunities for the way forward. In a changing global context, we believe there is an urgent need for this report.

First, there is clear evidence that young people were disproportionately affected by the COVID 19 pandemic, not just in Africa, but across the globe. Partial confinement measures and the closure of critical economic, educational, and social activities exacerbated existing inequalities and created new ones. Most youth were forced to alter or even set aside their earlier educational and professional plans and dreams. Moreover, agrifood systems suffered major setbacks in providing incomes and balanced nutrition due to the pandemic. This led to rising food insecurity on the continent and highlighted Africa's are highly vulnerable to shocks and crises.

Second, discourse on food and agricultural systems in Africa has evolved rapidly, with greater acknowledgment of the complexity existing within farms and beyond. The impacts of the climate crisis on food systems urge us to sharpen the focus on where, how, and by whom food is produced, processed, and consumed. The UN Food Systems Summit (UNFSS) held in 2021 (United Nations 2021) and the 2023 UNFSS+2 Stocktaking (United Nations 2023b) marked pivotal moments in the way the world views our agrifood systems–we can no longer consider food and agriculture at the farm production level alone or separate from nutrition, health, and environmental outcomes. Young people need to be seen as central actors and agents in shaping food and agricultural systems worldwide.

Third, global socio-economic developments in the past few years triggered by a worsening climate crisis and increasing conflicts have elevated discussions around the future of young people to the forefront of global political discourse. Young people around the world, including in Africa, are sounding concerns about the lack of prospects they face on issues ranging from inequality in meeting simple, but fundamental, needs like education and skill development to being represented in leadership positions. These economic, political, and environmental factors have contributed to youth migration, with many relocating from rural to urban areas or seeking opportunities abroad. Estimates suggest that by 2063, there will be over one billion young people between 15 and 35 years of age in Africa. However, as Africa's youth continue to shape the region's demographics, they increasingly face economic headwinds. More than 70 percent of young people live on less than USD 2.00 per day and youth unemployment is high, as is youth underemployment. Unable to absorb its young population into Africa's rural workforce, urban labor markets across Africa are feeling the pressure of young people migrating from rural areas into its cities.

There is a clear imperative: If governments can develop strategies to attract and support Africa's youth to succeed in agrifood systems, the youth bulge can yield a powerful demographic dividend with a tremendous impact on African economies. Increased adoption of technologies–especially machines and technologies that are adapted to local contexts–coupled with necessary skill development and training could stimulate jobs and entrepreneurial opportunities for young people in each segment of agrifood value chains across Africa.

The current report by the Malabo Montpellier Panel-YOUTH AHEAD: Policy innovations to create opportunities for young people in Africa's agrifood systems-reviews the challenges limiting young people's engagement in agrifood systems and then demonstrates opportunities to empower Africa's youth in agri-food systems. The report highlights the successful strategies implemented by various countries in Africa and summarizes the key findings of four systematically selected countries: Ghana, Uganda, Zambia and Zimbabwe. These countries are at the forefront of empowering youth in their agrifood systems. The report reviews these countries' policy and institutional innovations as well as their programmatic interventions targeting youth in the transformation of food systems. Their experiences are noteworthy for other African countries.

The time to act is now. African governments and their partners have the opportunity to leverage the synergies between the urgent need to create meaningful employment as well as an enabling environment for entrepreneurship for their young people in agrifood systems, the formulation and implementation of effective post-Malabo green growth agricultural and rural development agendas, and a rapidly transforming and dynamic agrifood sector. This moment must not be missed. We urge public and private sector actors to step up and elevate youth mainstreaming across all sectoral policymaking to a top policy priority. We call for: Diversifying education and training programs including skill up for entrepreneurship of youth; Addressing trade barriers coupled with technology infrastructure for jobs in a thriving agro-processing sector; Implementing dedicated processes to include youth in policy- and decision-making empowering youth; and Simultaneously addressing green growth and employment agendas with youth as investors.

Ousmane Badiane Co-Chair, of the Malabo Montpellier Panel

1.1. Brain

Joachim von Braun Co-Chair, of the Malabo Montpellier Panel

THE MALABO MONTPELLIER PANEL

The core mission of the Malabo Montpellier Panel, a group of leading African and international experts from the fields of agriculture, ecology, food security, nutrition, public policy, and global development, is to support evidence-based dialogue among policymakers at the highest level. The Panel's reports seek to inform and guide policy choices to accelerate progress toward the ambitious goals of the African Union Commission's Agenda 2063, the Malabo Declaration and the global development agenda. The Panel works with African governments and civil society organizations to provide support and evidence-based research that facilitate the identification and implementation of policies that enhance agriculture, food security, and nutrition.



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EXECUTIVE SUMMARY

Approximately ten years ago, the Malabo Montpellier Panel published a report on entrepreneurship in Africa's agriculture sector. The report stressed the opportunities awaiting Africa's young people in the agrifood sector. It delved into the actions governments must take to help small agribusinesses grow and prosper. Since then, we at the Malabo Montpellier Panel have highlighted in all our reports the challenges and opportunities of Africa's growing youth population as a critical cross-cutting policy issue for agrifood system transformation in Africa. With a sense of urgency, we now revisit the status of young people in Africa's agrifood systems to propose further actions to put youth at the center of those transformations and reflect on policy opportunities to accelerate the contributions African youth can make to those changes.

Africa is the youngest continent globallyapproximately 60 percent of its population is younger than 25 years, and over one-third are between 15 and 35. By the end of this century, the world's youth population may mostly come from Africa. However, as Africa's youth continue to shape the region's demographics, they increasingly face economic headwinds. The majority of young people in Africa live on less than USD 2.00 per day, and youth unemployment is high, as is youth underemployment. In a context where the annual number of young people joining the African labor market is more than that for jobs being created, youth poverty and unemployment figures are set to rise. Hence, there is an urgent need for African governments to accelerate the pace of job creation.

Africa's agrifood systems hold significant promise for improving youth employment and livelihoods. Moreover, youth will be pivotal to transforming Africa's agrifood systems and attaining the continent's job, growth, and health goals. The active involvement of young people in Africa's agrifood systems is essential for the continent's socio-economic development and prosperity, including improved food security.

African youth, however, still face challenges that hinder them from pursuing meaningful, decent, and profitable opportunities in the agrifood sector. Africa's agrifood systems are changing rapidly, are highly dynamic, and can offer many opportunities for entrepreneurship and employment along all segments of agribusiness value chains–from upstream science and research to production to processing of those agricultural products for value addition through to engagement with domestic, regional, and international markets.

To harness these economic opportunities in agrifood systems, young people must be equipped with skills and knowledge that match those demanded by rapidly transforming food systems. Such training must go beyond formal education. African governments need to invest at scale in various training institutions that support youth in acquiring strategic skills to build their innovation and entrepreneurship capacity across the agrifood value chains. The expanded skills they acquire will enable them to design and develop locally-suited technologies that improve the quantity and quality of food produced across Africa, contributing to achieving continental ambitions on food systems transformation and trade while increasing incomes for youth. However, attracting young people to pursue employment in agrifood systems will also require their active involvement and participation in political decision-making processes, particularly in designing policies that will enable youth to engage in those systems productively and profitably.

This report by the Malabo Montpellier Panel-YOUTH AHEAD: Policy innovations to create opportunities for young people in Africa's agrifood systems-summarizes key findings from case studies conducted in four systematically selected countries: Ghana, Uganda, Zambia, and Zimbabwe. The report reviews these countries' policy and institutional innovations and their programmatic interventions to target youth in transforming their food systems. These four countries' experiences can guide other African countries' strategies to achieve the same goals. Examples of key policy innovations in these countries include Ghana's Education Strategic Plan (ESP 2018-2030) to improve technical and vocational education and the National Employment Policy to create decent job opportunities for youth; and Uganda's Universal Secondary Education, which has increased young people's access to secondary education, and the Science Education Policy, which made science subjects compulsory at lower secondary level. To empower young people, the government of Zambia implemented the Skills Development Levy to fund technical and vocational training, while the government of Zimbabwe established EmpowerBank - a youthfocused bank to improve young people's access to business finance.

While most African governments have long recognized that turning their youth bulge into a demographic dividend for their economies must be a policy priority, efforts must be redoubled to ensure that Africa's young people are equipped with the required skills, knowledge, resources, and supportive environments. All these are needed if youth are to thrive economically and play an important role in sustainably transforming and elevating food systems across the continent.

The Action Agenda presented by the Malabo Montpellier Panel draws on Africa-wide experiences and those of the four countries to highlight several key factors underlying some of the successes achieved in creating economic opportunities for young people in Africa's agrifood systems:

Diversify education and training programs for youth entrepreneurship-While tailor-made upskilling programs, enterprise-based training, and apprenticeships will address short-term gaps, earnest efforts will be required to update, upgrade and diversify sources of technical training. Only with such efforts will these skills development institutions be fit to buttress food systems that rapidly evolve through technological advances. To facilitate entrepreneurship and employment for young Africans in agriculture and agribusinesses, several governments and development partners have introduced innovative training programs. These often combine capacity enhancement with access to finance and mentorship to successfully support and steer youth-run agribusinesses.

Address trade barriers coupled with technology infrastructure for jobs–To stimulate agriculture trade, tariff and non-tariff barriers need to be removed. Such actions should be coupled with increased investments in technology and the infrastructure necessary to stimulate a more dynamic, technology-driven, and thriving agroprocessing sector. The infrastructure investments should be designed to create employment directly and indirectly . Through these investments in agro-processing and the strengthened forward links to marketing and trade and backward links to production that result, these value chains will become a core employment-generating sector in agrifood systems.

Design and implement dedicated processes to include youth in policy- and decision-making-Establish formalized consultations and platforms through which the opinions of young people around sustainable food system transformation can be captured. Such processes will enable youth to actively participate in and shape policy design and implementation at the national, regional, economic community, and continental levels. Mainstream youth across all aspects of agrifood system policy design and decision-making procedures. Youth are not a homogeneous group and their specific needs and demands must be reflected in how governments set priorities and design policies and strategies that impact the participation of youth and future generations in food systems across Africa. This includes a dedicated ministry or departments that work cross-governmental to support youth mainstreaming in these processes. The resulting youth-focused policies would empower youth to take on job creation or employment opportunities in transforming food systems, contributing to economic growth.

Simultaneously address green growth and employment agendas with youth as investors-Ensure that environmentally sustainable economic growth and employment generation agendas are designed and implemented in ways that are mutually reinforcing and beneficial. Such efforts must include youth-oriented technology and innovation systems and much better access to business finance by youth entrepreneurs. The rural banking sector is called upon to play an important role in ensuring that green growth results in increased employment and industrial expansion while ensuring that any new jobs generated support sustainable and equitable economic growth. One such approach can be the development of bioeconomies at scale at the national and continental levels.

1. INTRODUCTION

Youth are pivotal to transforming Africa's agrifood systems and to attaining the continent's job, growth, and health goals. While African governments have long recognized that turning the youth bulge into a demographic dividend must be a top policy priority, efforts must be redoubled to ensure that Africa's young people are equipped with the skills, knowledge, and supportive environments that they need to thrive and to play their role in sustainably transforming and elevating food systems across the continent.

Currently, around 60 percent of Africa's population is younger than 25 years and more than one third is aged between 15 and 35 years. The median age across Africa is 18 years, compared to 35 in North America or 47 in Japan (BMGF 2018). In 2020, Africa's population between 15 and 35 years of age was 454 million, amounting to 23 percent of the world's total youth population (Text Box 1.1). Between now and 2100, Africa's youth population is expected to grow by 181 percent, while Europe's will shrink by 21 and Asia's by 28 percent. It is expected that by 2063, there will be over one billion young people aged between 15 and 35 years in Africa (PRB 2019). By 2100, almost half of the world's youth will be from Africa (Rocca and Schultes 2020).

Text Box 1.1. Definition of youth

The United Nations, for statistical purposes and without prejudice to member state definitions, defines youth as those aged between 15 and 24 years (United Nations 2018). In contrast, the African Union, as per the African Youth Charter, defines young people as those aged between 15 and 35 years (African Union 2006). For this report, we adopt the African Union's definition.

However, as Africa's youth continue to shape the demographics of the continent, they face increasing economic headwinds. More than 70 percent of young people live on less than USD 2.00 per day and youth unemployment and underemployment–when a person is employed, but not in a desired capacity in terms of skills, experience, or compensation–is high. With Africa's

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However, as Africa's youth continue to shape the demographics of the continent, they face increasing economic headwinds.

rural economies currently unable to absorb its young population as workers, Africa's urban labor markets are feeling the pressure of young people migrating from rural areas into cities. According to the International Labour Organization (ILO), unemployment among young people globally is over three times more common than among older adults (ILO 2022a).

In Africa South of the Sahara, informal employment as a percentage of total employment is 89 percent (Kiaga and Leung 2020). As a result, many young people face limited prospects for economic advancement and have poor access to social safety nets, decent income, or any form of workers' rights. As of 2019, 16 million young Africans faced unemployment, with about 40 percent living in poor conditions (Kweitsu 2019). In a context where about 11 million young people join the African labor market each year and only 3.7 million jobs are created annually, this unemployment figure is set to rise (Kariba 2020).



Africa's agrifood systems hold significant promise for improving youth employment and livelihoods.

A growing mismatch between the supply and demand for labor is one of the main drivers of high youth unemployment and underemployment rates. Put differently, there is a mismatch between the qualifications and skills that young people across Africa have to offer and what the African labor market needs. However, while the lack of decent jobs for young people currently presents an immense challenge, it can also be a great opportunity, particularly in Africa's rapidly transforming food systems.

Africa's agrifood systems hold significant promise for improving youth employment and livelihoods. Africa's growing urban population and middle-class demand more varied, nutritious, processed, ready-to-cook and ready-to-eat foods. This increased demand can generate new jobs and entrepreneurial opportunities for young people along African agribusiness value chains. A continent full of promise, Africa's agrifood transformation can be realized by catalyzing an entrepreneurial environment that starts at the farm and is coupled with the enterprising spirit of its youth. Despite increased attention to and financing for African agrifood systems over recent decades, the sector's potential remains largely untapped. Young people often view agriculture as involving outdated, unprofitable, and drudging work. Yet, this is not the case. Agrifood systems are dynamic, offering a broad range of opportunities for entrepreneurship along their value chains. However, those interested in pursuing employment in an agrifood system as

A continent full of promise, Africa's agrifood transformation can be realized by catalyzing an entrepreneurial environment that starts at the farm and is coupled with the enterprising spirit of its youth

entrepreneurial producers, processors, or traders often struggle to obtain land and capital, have limited access to quality education and vocational training to build their skills, have restricted access to information, financial resources, markets, and innovative technologies (FAO and AUC 2022). These obstacles must be urgently addressed. Examples from several African countries show that moving the needle to promote increased entrepreneurship and employment in agrifood systems is possible.

Across many parts of Africa, commendable progress has been made in recent years to increase agricultural productivity; reduce hunger, malnutrition, and poverty; create new employment opportunities; and improve the livelihoods of rural communities. Yet, parallel socio-economic changes mean that pressure is growing on food systems to make more varied and nutritious food available and accessible. To meet this accelerated food demand, we are seeing rapid increases in food imports across the continent despite strong agricultural sector growth (Christiaensen 2020, Sileshi 2021).

Africa must accelerate its transition from mainly producing and exporting raw materials and importing processed foods to establishing a thriving and competitive agro-processing sector that delivers on the African Union's Agenda 2063 targets of economic growth, wealth generation, and employment (AUC 2015). Failure to do so will mean lost opportunities for significant wealth generation among both rural and urban populations (Badiane, Collins and Glatzel, et al. 2022). A thriving agro-processing sector, in particular, offers a multitude of benefits. Transforming, preserving, and preparing food for intermediate or final consumption brings together the best of the agricultural, manufacturing, and services sectors. A flourishing food processing sector will alleviate seasonal shortages in food supply, stabilize market prices, reduce postharvest losses, unlock demand for nutritious foods, and improve food safety standards. Agro-processing can also diversify the uses and, hence, markets for agricultural produce. Crucially, agro-processing holds great promise for young entrepreneurs (Jenane, Ulimwengu and Tadesse 2022, Malabo Montpellier Panel 2021b).

Africa must accelerate its transition from mainly producing and exporting raw materials and importing processed foods to establishing a thriving and competitive agroprocessing sector that delivers on the African Union's Agenda 2063 targets of economic growth, wealth generation, and employment (AUC 2015). Failure to do so will mean continued food import dependency, heightened vulnerability to global supply shocks, and lost opportunities for significant wealth generation among both rural and urban populations

(Badiane, Collins and Glatzel, et al. 2022).

Agrifood systems provide an important channel for solving the unemployment and underemployment challenges facing African youth while strengthening them will reduce poverty and bolster food security on the continent. Currently, farming accounts for about 60 percent of total employment in Africa. This share of employment rises significantly when jobs along the entire food value chain are taken into account. In Ethiopia, Malawi, Mozambique, Tanzania, Uganda, and Zambia, food systems are projected to add more jobs between 2010 and 2025 than in the rest of their economies (Ehui 2018). Yet, young people are not sufficiently pursuing employment opportunities in the agriculture sector.

Attracting youth to pursue work in the agrifood sector and enabling them to play an active role in shaping African food systems will require creating new opportunities in agribusiness and leveraging the potential of new technologies for the sector. These efforts must be matched with programs that offer youth the necessary skill development training for food systems transformation, both within formal education systems and beyond (BMGF 2018). Now is the right time: As access to mobile telephones and the internet has rapidly expanded across Africa, young people are harnessing these technologies to actively shape their own futures and that of the economies on which they depend. In countries across the continent, thriving start-up firms are disrupting how we think about African agrifood systems, entrepreneurship, digital

In Ethiopia, Malawi, Mozambique, Tanzania, Uganda, and Zambia, food systems are projected to add more jobs between 2010 and 2025 than in the rest of their economies (Ehui 2018). Yet, young people are not sufficiently pursuing employment opportunities in the agriculture sector.

technology, and sustainability. The year 2021 was record-breaking for Africa's start-up scene-firms within it secured over USD 2 billion in funding (El Habti 2022). The majority of these businesses are led by young people under 35 years of age.

This entrepreneurial spirit of Africa's youth visible in many parts of the continent must be harnessed to deliver locally relevant solutions to strengthen and expand local agrifood systems. Fostering business-friendly environments and cultures of entrepreneurship will be key, while a longterm, sustainable transformation of agrifood systems requires improved access to quality education. Investing in education and practical and transferable skills training–such as computer programming, data science, and business studies– is necessary to maximize the potential of young people to advance Africa's agrifood and economic transformation. Crucially, whether Africa's fastgrowing population of youth will provide a dividend that can contribute to accelerated human and economic development on the continent will depend on whether governments and the private sector can create the right conditions and the right enabling environment–policies, strategies, and programs. Such investments are necessary to equip African youth with the skills and tools that they can apply in employment, entrepreneurship, and leadership within agrifood systems.

This report by the Malabo Montpellier Panel focuses on skill development for African youth. There is growing recognition that Africa's education programs-going beyond formal education systems and traditional curricula-must be reimagined to nurture an enterprising spirit that will benefit all African societies. Because it provides the means to harness a demographic dividend from Africa's youth for accelerated development, (higher) education, vocational training, and skill development programs will shape the continent's future (El Habti 2022). Additionally, as African countries increasingly follow green economy development pathways to achieve sustainable development without degrading the environment, new opportunities will emerge, including in the bioeconomy.

This report will provide examples of successful and emerging interventions being implemented across the continent to empower youth and facilitate a thriving environment for their leadership and engagement in sustainable food systems transformation.



Special feature: Structural transformation of Africa's agrifood systems

Over the past few decades, Africa has experienced a remarkable economic growth recovery. Sustaining this recovery and ensuring that socioeconomic and climatic shocks do not jeopardize this growth trajectory requires successful structural transformation. Such transformation implies a process through which low-income societies, which derive most of their labor and economic output from agriculture, diversify production into higher-valued goods in the manufacturing and the services sectors, while continuing to raise agricultural productivity even as agriculture's share in the economy declines. This structural transformation takes place within a context of rising competition from producers around the globe on the one hand and rapid urbanization, demographic change, and a growing middle class domestically on the other. A successful agrifood systems transformation leading to broad-based employment and income growth-particularly for the continent's young people-particularly requires increased investments in the continent's rapidly growing food and beverage markets.

Trends and patterns in structural transformation in Africa

The first decade following independence in the 1960s was marked by strong overall economic growth across Africa. This deteriorated rapidly and significantly the following decade, and by the 1980s, GDP growth had dropped to just 1.5 percent per year, while annual agricultural growth averaged only 0.5 percent-far below the population growth rate of 3 percent per year at that time. However, in the late 1980s agricultural growth started to increase. By the late 1990s, overall economic growth followed suit. By the first decade of this century, agricultural growth reached 5 percent per year-nearly twice the annual growth rate of the population of 2.7 percent. Since 2000, African countries have experienced the longest period of sustained economic and agricultural growth since independence. This growth has spread broadly across the continent, albeit with significant regional differences (Badiane and Collins 2016). The third Biennial Review of the Comprehensive Africa Agriculture Development Programme by the African Union showed that 21 of the 51 member states reported being on track to achieve by 2025 the target of a minimum of 6 percent annual growth rate in agriculture value

added (African Union 2022). This is a significant increase from the second Biennial Review (African Union 2020d), in which only three countries– Angola, Gabon, and Liberia–were determined to be on track. This performance also compares favorably with the inaugural Biennial Review in which only 18 countries were found to be on track (African Union 2018a).

Agricultural growth has not matched the pace of accelerating food demand in the context of continued population growth and rising incomes. Between 2000 and 2011, the ratio of agricultural exports to imports reduced from 0.8 to 0.55, which then increased to 0.71 in 2020 (RESAKSS 2024). Although Africa's agricultural exports have increased in recent years, the continent is still a net importer with a food import bill of approximately USD 80 million annually as compared to USD 61 billion in exports (FAO and AUC 2021). but this level of exports remains well below that of imports. Hence, there has been a widening of Africa's agricultural trade deficit.

As evidenced by the strong growth in agricultural exports, this agricultural trade deficit is not an indicator of the failure of Africa's agrifood systems. Rather, it is a symptom of the compound challenges of continued population growth, fast income growth, and rapid urbanization that have led to increased demand for greater quantities and more varied food (Badiane, Collins and Glatzel, et al. 2022). However, this increased demand also underlines the opportunities available to African governments to leverage the yet untapped potential of its agrifood systems to competitively raise agricultural output and to meet future demands on the continent and in global markets.

Moreover, recent growth in Africa's agrifood systems is mirrored by trends in poverty levels– the progress by African governments in reducing poverty levels is closely linked to agricultural growth trends. Africa has made some progress in poverty reduction, as shown by the reduced poverty headcount rate across the continent, but more effort is needed since the total number of people living below the poverty line is still significant–in 2021, 490 million people in Africa were estimated to be living under the poverty line of USD 1.90/day. Moreover, the COVID-19 pandemic significantly slowed the number of people escaping poverty in Africa (UNCTAD 2021).

A stunted agriculture sector

Failure by governments in the 1970s-1980s to provide an enabling environment in which agrifood systems could thrive coupled with providing little freedom for the private sector to flourish resulted in what is referred to as a "stunted agriculture sector". With little or no prospects of obtaining decent livelihoods from their farming, many smallholders-including young people-decided to leave agriculture and seek employment elsewhere. However, the economy outside of agriculture was unable to absorb this influx of labor from farming. This resulted in a dynamic that is considered unique to the pace and patterns of transformation of African economies-a faster-than-usual decline of the agriculture sector combined with a larger-than-usual non-agriculture sector dominated by an oversized services sector. Compared to other regions of the world at a stage of economic development similar to where African economies are today, agrifood systems play a much smaller role in African economies (Badiane 2011). Moreover, in contrast to other regions, most non-farm employment in Africa is in the informal sector-up to 90 percent of jobs outside of the agriculture sector are in the informal sector (Conway, Badiane and Glatzel 2019).

As shown by Badiane (2011), those countries showing the greatest degree of "stunting" or underperformance in their agricultural sector growth are also those that show the highest levels of poverty. This is particularly problematic within a context where population growth is on the rise with between 10 and 12 million young people entering the labor market each year (AfDB 2016b). However, since 2000, a shift has been seen in the way policies are designed and priorities set for the transformation of Africa's agrifood systems. This has resulted in positive growth trends and offers a reason for optimism-the size of the agriculture sector across Africa has grown by about two-thirds, while the share of the population living in poverty has dropped by more than one-third. Nutrition indicators have also markedly improved in recent years.

Coupled with an enabling environment that elevated agrifood systems to a top policy priority at continental and national levels and a thriving private sector, investments in traditional and emerging agrifood value chains are on the rise. Agribusinesses are mushrooming to meet increased demand from the continent's young population and growing middle class for more varied, processed, and nutritious foods. This creates new opportunities for farmers in production as well as for young people in each segment of the agrifood system, whether as producers, processors, or traders.

Opportunities and the way forward

Sustainable and lasting transformation of Africa's agrifood systems needs to lead to equal opportunities, employment generation, and income growth that is broad-based and rapid enough to lead to significant reductions in poverty rates and improvements in living standards. Identifying future trends and determining their dynamics within Africa's agrifood systems will allow government planners, the private sector, and other stakeholders to determine the optimal set of policies, investments, and tools needed to transform those systems. A better understanding of trends within each segment of agrifood value chains and determining which segments are growing the fastest or have the highest potential for wealth creation and associated multiplier effects can then be matched with necessary skills development and training needs (Badiane, Collins and Glatzel, et al. 2022). This is of particular importance within the context of job creation goals that seek to accommodate the large number of young people entering labor markets across Africa each year.

According to the World Bank (2022), the African agricultural economy is now the fastest growing across all continents-it saw 4.1 percent growth from 2000 to 2020, compared to an average of 2.7 percent worldwide. Some estimates suggest that Africa's combined food and beverage markets will triple in value from USD 313 billion in 2013 to USD 1.0 trillion by 2030, with consumption in cities driving the demand for more products (World Bank 2013, Conway, Badiane and Glatzel 2019). Moreover, the share of processed foods is projected to increase five to tenfold between 2010 and 2040, translating to nearly 80 percent of staple food demand (Tschirley, et al. 2015).*

^{*} Processed food is any food that undergoes any transformation from its original state beyond removal from the plant and, for perishables, drying. A processed food item is defined as low processed if it satisfies fewer than two of the following conditions and is considered to be high processed if it satisfies two or more: (1) has multiple ingredients (it automatically is considered high processed if one of the ingredients is high processed); (2) had physical change induced by heating, freezing, extrusion, or chemical processes, i.e., more than simple physical transformation, such as cutting, sifting, sorting, removing from pod; and (3) has packaging more complex than simple paper or plastic (Tschirley, et al. 2015).

This growing demand for perishable, high-value, and processed foods is also leading to changes within agrifood value chains, including their increased length and complexity, greater volumes of food handled, and more firms investing in midstream segments, including processing and packaging (Badiane, Collins and Glatzel, et al. 2022). Due to a lack of disaggregated data, it remains difficult to quantify growth in the agroprocessing sector, but a rise in the numbers of local small and medium-scale enterprises processing staples and other crops has been observed across the continent in recent years (Hollinger and Staatz 2015, Reardon, et al. 2015). In addition, employment analyses suggest that the agro-processing sector and other nonfarm agrifood system segments are expanding rapidly, although from a low base (Yeboah and Jayne 2016). Another study predicts rapid growth in employment in off-farm segments of the agrifood system, with employment shares rising from 8.0 percent in 2010 to 11.2 percent in 2025 and 13.5 percent in 2040 (Tschirley, et al. 2015). Over the next four years, off-farm agrifood

jobs are expected to account for between 18 and 22 percent of new jobs in Tanzania, 18 percent in Nigeria, and 11 percent in Rwanda. The number of food manufacturing jobs in these three countries is expected to grow between 12 and 20 percent (Allen, Howard, et al. 2016).

However, the growth of Africa's processing sector will need to keep pace with increased domestic demand for more food and for more processed and varied food items. In addition, to tap into regional and global markets, the processing sector needs to be further strengthened and expanded. Hence, Africa's rapidly modernizing and transforming agrifood systems—the food processing sector, in particular—present major opportunities for further growth in African economies. The sector has the potential to become an important source of employment generation for young people, offering the application of novel digital technologies and tools for product and process innovation, higher incomes, and improved livelihoods.



2. ACTION AGENDA AND KEY LESSONS FROM THE COUNTRY CASE STUDIES

2.1 Value chain competitiveness to drive employment creation

To meet the continental ambitions on food systems transformation and trade, it is essential that, in addition to increased productivity in farming, regional food processing capacities and overall value chain competitiveness get strengthened. In particular, emphasis should be placed on the numerous income-generating opportunities for youth post-production, especially for food products that are of high value and contribute to improved nutrition. This calls for investments that support youth in designing and developing technologies that improve both the quantity and quality of food and increased provision of and access to training facilities for developing strategic skills that will build innovation capacity within agrifood value chains across Africa.

Diversify education and training programs for youth entrepreneurship—While tailor-made up-skilling programs, enterprise-based training, and apprenticeships will address short-term gaps, earnest efforts will be required to update, upgrade and diversify sources of technical training. Only with such efforts will these skills development institutions be fit to buttress food systems that rapidly evolve through technological advances. To facilitate entrepreneurship and employment for young Africans in agriculture and agribusinesses, several governments and development partners have introduced innovative training programs. These often combine capacity enhancement with access to finance and mentorship to successfully support and steer youth-run agribusinesses.

■ Address trade barriers coupled with technology infrastructure for jobs—To stimulate agriculture trade, tariff and non-tariff barriers need to be removed. Such actions should be coupled with increased investments in technology and the infrastructure necessary to stimulate a more dynamic, technology-driven, and thriving agro-processing sector. The infrastructure investments should be designed to create employment directly and indirectly. Through these investments in agro-processing and the strengthened forward links to marketing and trade and backward links to production that result, these value chains will become a core employment-generating sector in agrifood systems.

Design and implement dedicated processes to include youth in policy- and decisionmaking—Establish formalized consultations and platforms through which the opinions of young people around sustainable food system transformation can be captured. Such processes will enable youth to actively participate in and shape policy design and implementation at the national, regional, economic community, and continental levels. Mainstream youth across all aspects of agrifood system policy design and decision-making procedures. Youth are not a homogeneous group, and their specific needs and demands must be reflected in how governments set priorities and design policies and strategies that impact the participation of youth and future generations in food systems across Africa. This includes a dedicated ministry or departments that work cross-governmental to support youth mainstreaming in these processes. The resulting youth-focused policies would empower youth to take on job creation or employment opportunities in transforming food systems, contributing to economic growth.

Simultaneously address green growth and employment agendas with youth as investors—Ensure that environmentally sustainable economic growth and employment generation agendas are designed and implemented in ways that are mutually reinforcing and beneficial. Such efforts must include youth-oriented technology and innovation systems and much better access to business finance by youth entrepreneurs. The rural banking sector is called upon to play an important role in ensuring that green growth results in increased employment and industrial expansion while ensuring that any new jobs generated support sustainable and equitable economic growth. One such approach can be the development of bioeconomies at scale at the national and continental levels.

2.2 Summary lessons from country case studies

Drawing lessons from country-level innovations and successes to expand the economic opportunities for youth through finding employment or establishing businesses in national agrifood sectors can provide important opportunities to deliver rapid and sustainable impact on youth in other contexts. The experience

of the four African countries examined in the case studies in this report–Ghana, Uganda, Zambia, and Zimbabwe–shows what government action can contribute to building a conducive enabling environment for empowering youth in Africa's agrifood systems.



Ghana. The Government of Ghana recognizes the importance of its young population in building and developing the nation. With the youth population growing rapidly, the government has implemented policies and established institutions, such as the Youth Employment Agency, to support young people in gaining access to decent job opportunities

in sectors such as agriculture. The government launched the National Youth Policy to specifically resolve the challenges faced by their youth, such as unemployment and lack of skills training. To meet the demand for a skilled workforce, the government focuses on the provision of free secondary education and improved access to quality tertiary education or specialized skills training, such as information and communication technologies (ICT) and entrepreneurship through the implementation of the Education Strategic Plan (2018-2030) to improve technical and vocational education. Additionally, the government strives to reduce youth unemployment by implementing programs, such as the National Entrepreneurship and Innovation Programme, which empowers young people to create jobs.



Uganda. The Ugandan government has implemented numerous policies and strategies for youth empowerment, such as Universal Secondary Education, which has increased young people's access to secondary education, and the Science Education Policy, which made science subjects (biology, chemistry, mathematics, and physics) compulsory at lower

secondary level. In line with the Uganda Vision 2040, which recognizes the opportunity for youth to contribute to the country's economic growth, the government has established various technical and vocational training institutions and programs focused on building valuable skills in the country's youth to lower Uganda's youth unemployment rate–Uganda has the second youngest population globally. Youth-focused institutions and programs, such as the Presidential Zonal Industrial Hubs, the Uganda Industrial Research Institute Innovation Centre, and the Youth Livelihood Programme, provide youth with marketable skills in agrifood processing and product development, ICT, agricultural mechanization, and entrepreneurship. The expertise that the youth acquire from these institutions and programs enables them to become job creators by starting their own businesses with additional support, if needed, from the same or other youth-focused institutions and programs.



Zambia. The Government of Zambia has established several institutions and policies to ensure that youth concerns and needs, such as access to quality education, skills training, and healthcare, are included in public policy processes and investment programming towards Vision 2030. Importantly, the government set up the Skills Development Levy to exclusively mobilize resources that can be invested in youth

empowerment through strengthening the infrastructure of technical and vocational training institutions. Regarding youth engagement in agrifood systems, the recently approved Comprehensive Agricultural Transformation Support Programme (CATSP) focuses on skill development among youth to drive the muchneeded transformation in Zambian food systems.



Zimbabwe. The Government of Zimbabwe has strongly emphasized policies and reforms to economically empower the country's youth. It has also promoted initiatives aimed at youth mainstreaming in the national development agenda, such as creating youth desks within most government ministries and establishing EmpowerBank to

improve youth access to finance. The National Youth Policy implemented by the Ministry of Youth, Sport, Arts, and Recreation promotes an integrated approach to the socio-economic empowerment of youth. Moreover, the Technical Vocational Education and Training Policy adopted in 2023 aims to strengthen and streamline vocational education for youth to ensure that the content and skills delivered to them match the needs of Zimbabwe's labor market.

3. CONTINENTAL AND GLOBAL FRAMEWORKS TO EMPOWER AFRICA'S YOUTH IN AGRIFOOD SYSTEMS

African countries have signed and ratified several continental and international declarations and frameworks to promote the role and rights of young people and to drive their economic empowerment. This chapter provides an overview of the key continental policy frameworks on the role and rights of young people in Africa and their empowerment, explicitly focusing on commitments concerned with food systems, food security, and nutrition. The broader global policy frameworks on youth and empowerment to which these African policy commitments are linked are also described.

3.1 Continental policy frameworks

3.1.1 Dakar Youth Empowerment Strategy

At the 2001 World Youth Forum, the Dakar Youth Empowerment Strategy was launched (United Nations 2001). Drafted primarily by the Forum's youth delegates, the Strategy contains a set of areas identified for greater investment and attention to ensuring the full participation of youth in society. Among these, decent employment opportunities for youth are recognized as an urgent need. More specifically, the strategy specifies three main interventions: a) greater investment in skills training for youth through improved collaboration between employers and training institutions; b) increased promotion of youth entrepreneurship by offering better market information, business skills training, access to capital, and mentorships; and c) adequate social and labor protections for youth workers by improving their working conditions, promoting labor rights, and guaranteeing a minimum income. Since its creation, the Strategy has informed national youth policies such as the 2019 Kenya Youth Development Policy and other frameworks, including the 2006 Arab Declaration on Youth Empowerment.

3.1.2 African Union Frameworks and Policies for Youth in Agrifood Systems

The African Union (AU) has devised policies and frameworks to support youth empowerment which have implications for the work of youth in agrifood systems. These frameworks include the 2011 Malabo Declaration on Creating Employment for Accelerating Youth Development and Empowerment and the Youth Decade Plan of Action (2009-2018). More recently, the AU has developed a set of strategic frameworks that illuminate the role of youth in shaping Africa's food systems and future. The following are among these frameworks:

Comprehensive Africa Agriculture Development Programme (CAADP)-A notable target pertaining to youth is the CAADP-Malabo Performance Indicator 4.3 on youth jobs in agriculture. This indicator measures at a country level the percentage of youth engaged in new job opportunities along the agriculture value chain. African Heads of State committed to creating new jobs in agriculture for at least 30 percent of youth by 2025. The Biennial Review reports track the progress of AU member states toward the CAADP-Malabo goals. Most of the 22 countries that reported on indicator 4.3 in the first Biennial Review met the minimum score to remain on track, while for the second Biennial Review, 14 of the 32 countries reporting were found to be on track. The third and most recent BR revealed that 17 countries were on track to meet the indicator out of the 34 countries reporting (African Union 2022).

During the 2016 CAADP Partnership Platform meeting, a CAADP Youth Network was established to mainstream African youth perspectives and voices into the implementation of the Malabo commitments under CAADP and to monitor those processes to ensure youth play an active role in Africa's agricultural development. To elevate youth voices, the network works to promote youth participation in monitoring and implementing Regional and National Agriculture Investment Plans and Joint Sector Review processes; advancing implementation at regional, national, and sub-national levels of the Youth Engagement Toolkit on CAADP and the Malabo Declaration; documenting best practices for youth in climatesmart agriculture and agribusinesses; and engaging in policy advocacy on behalf of youth in agrifood systems.

AU African Youth Charter–Adopted by the African Union in 2006, the African Youth Charter details and affirms a set of social and economic rights pertaining to young people on the continent (African Union 2006). Of note, Article 13 of the charter focuses on education and skills development for Africa's youth. It attests to the rights of youth to access primary and secondary education along with vocational education and

training that is "relevant to prospective employment opportunities..." Additionally, Article 14, which focuses on poverty eradication and socioeconomic integration of youth, recognizes the right of young people to access training and credit to enable their participation in "agricultural and other sustainable livelihood projects..." Further, Article 15, which covers sustainable livelihoods and youth employment affirms the rights of youth to gainful employment and protection from exploitative and harmful work.

African Plan of Action for Youth Empowerment-Developed in 2019, the African Plan of Action for Youth Empowerment (APAYE) is a five-year framework for implementing the AU African Youth Charter. APAYE provides an overarching guide for implementing youth empowerment programs and policies in Africa (African Union 2020b). The main objectives of APAYE are to bolster education, employment, entrepreneurship, and engagement opportunities to boost youth health and well-being and, second, to create the enabling environment for youth to actively contribute to the continental development agenda through supporting inclusive legal frameworks, peace, and good governance across Africa. The Plan outlines seven key interventions for catalyzing youth employment and empowerment on the continent-promoting alternative education pathways, such as remote learning, to reach more young people; improving the quality of teaching; providing more internships and apprenticeships to better integrate youth into the workforce; nurturing youth-led start-ups; rolling out leadership, training, mentorship, and job shadowing programs; establishing a framework for youth consultations; and introducing a continentwide campaign on youth mental health and wellbeing.

African Agribusiness Youth Strategy–In 2020, the African Union published its African Agribusiness Youth Strategy (AAYS) with the aim of providing new opportunities for youth in agriculture value chains (African Union 2020a). AAYS is meant to serve as a harmonizing roadmap for youth in agribusiness initiatives at the levels of the AU member state, regional economic community, and continental. The strategy recognizes the importance of agribusiness as a key pathway to job creation, economic growth, and improved food security. The primary aim of the strategy is to ensure that African youth have the resources, knowledge, and skills to actively participate in policy development and decision-making

processes concerning agribusiness and to advance their agribusiness ventures. Its three main pillars are building systems for implementation at the national and sub-national levels; transforming markets to give young agricultural entrepreneurs better access to large formalized markets, digital markets, and cross-border and regional markets; and strengthening agrifood value chains by making them more youth-inclusive by enabling young agricultural entrepreneurs build strong agribusinesses across all levels of these value chains. Central to fulfilling the aims of the pillars are the principles of inclusivity and innovation. Moreover, the AAYS offers guidance for AU member states to incorporate youth agribusiness considerations and programming into their National Agriculture Investment Plans and youth employment and entrepreneurship development strategies.

3.1.3 African Union Development Agency-NEPAD Youth Frameworks and Initiatives

Strategic Framework for a NEPAD Youth Programme-This framework was published in 2015 and has been a guiding structure for AUDA-NEPAD's engagement with Africa's youth (NEPAD 2015). It recognizes the critical role young people play in Africa's development and calls for AU, AUDA-NEPAD, and their partners to fully integrate youth into their decision-making processes. The framework highlights unemployment as a major challenge facing African youth and encourages governments to support youth entrepreneurship and employment programs, particularly through strengthening links with the private sector. Recognizing the diversity of Africa's youth, the framework advocates for targeted interventions for young women, rural youth, indigenous youth, youth with disabilities, and other traditionally marginalized groups. Lastly, the framework offers guiding principles to shape the design, implementation, and monitoring of youth policies and programs on the continent. These principles involve affirming youth agency and their importance to Africa's development, aligning youth development initiatives with existing development priorities, equal protection and pride across youth identities, and special attention to socially excluded youths. AUDA-NEPAD has recently instituted programs in line with the Youth Programme's aims and outcomes, notably the Energize Africa and Rural Futures Initiatives (Text Box 3.1).

Text Box 3.1. Energize Africa and Rural Futures Initiatives of African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD)

In 2022, AUDA-NEPAD launched Energize Africa at the United Nations General Assembly in partnership with Afreximbank (AUDA-NEPAD 2022b). The initiative aims to harness Africa's youth as key contributors to the continent's development and create economic opportunities for young people in strategic sectors, including agrifood industries. Energize Africa consists of public sector, private sector, and blended finance components designed to catalyze innovation and investment. These are to empower youth to play an active role in shaping the continent's future.

Along with Energize Africa, AUDA-NEPAD established the Rural Futures Programme to improve and increase employment opportunities and boost household incomes for rural populations through transforming rural economies (AUDA-NEPAD 2022c). The program builds on existing AU frameworks, such as CAADP and the Programme for Infrastructure Development in Africa (PIDA). A key component of the program involves interventions aimed at generating decent employment for rural youth and enhancing entrepreneurship in agrifood systems.

3.1.4 Abidjan Declaration of the International Labour Organization

At its 2019 Africa Regional Meeting, the International Labour Organization put forth the Abidjan Declaration on Advancing Social Justice-Shaping the Future of Work in Africa (ILO 2019a). The declaration builds on global commitments made under the Sustainable Development Goals, Agenda 2063 of the African Union, and the African Continental Free Trade Area, with a recognition of the importance of youth in achieving these ambitions. In particular, the declaration calls for investments in "making decent work a reality for Africa's youth, developing skills, technological pathways, and productivity for a brighter future in Africa, transforming Africa's informal and rural economy for decent work, and respecting international labor standards, promoting social dialogue and ensuring gender equality." To achieve these priorities, the Abidjan Declaration concludes with a guide for implementation that centers on generating an enabling environment, productivity growth, sustainability, and inclusion standards, along with social and legal protections critical to building a humane future of work in Africa for the next generation.

3.1.5 Jobs for Youth in Africa Strategy of the African Development Bank

Launched in 2016 by the AfDB, the Jobs for Youth in Africa Strategy (2016-2025) aims to create 25 million jobs and equip 50 million young people with employable skills by 2025 (AfDB 2023a). The strategy recognizes the need for investments in entrepreneurship and in small and mediumsized businesses with the potential for large-scale job creation. As part of the strategy, AfDB aims to invest USD 25 billion in projects that provide skills, entrepreneurship, and business training, as well as job creation. Notable programs have been established under the strategy. These include the Youth Entrepreneurship and Innovation Multi-Donor Trust Fund; Entrepreneurship and Innovation Lab; the Souk At-tanmia in Tunisia; the Coding for Employment Program; the Enable Youth Program; and the Skill Enhancement Zones.

3.2 Global Policy Frameworks

3.2.1 World Programme of Action for Youth to the Year 2000 and Beyond (1995)

The World Programme of Action for Youth (WPAY) was adopted by the UN Economic and Social Council (ECOSOC) in 1995 (United Nations 2010). WPAY contains 15 priority areas identified as critical to enabling the full participation of young people in society and decision-making. Within these priorities, WPAY lays out guiding principles and frameworks for how states, regional bodies, and other actors can effectively promote youth empowerment. Regarding education and employment, WPAY calls for country governments to provide their youth with adequate education and skills to fully participate in society, obtain productive employment, and lead self-sufficient lives. Recommended actions include entrepreneurship and vocational training programs, providing grants and other funding schemes to support youth-led business ventures, targeted support to youth who face significant barriers to employment such as youth with disabilities and refugees, and generating work opportunities for youth in rapidly growing fields where technological innovation is occurring. With regard to agriculture and making the sector more attractive to youth, the framework recommends enhancing agricultural skills training and extension services, providing land grants to youth, and investing in rural communities.

3.2.2 Braga Youth Action Plan (1998)

Adopted at the Third UN World Youth Forum in 1998, the Braga Youth Action Plan was put forth by youth delegates and youth-serving organizations, along with UN representatives and inter-governmental organizations (United Nations 1998). The Plan asserts the importance of youth participation for the progression of humankind and provides recommendations for empowering young people to participate in advancing human development goals. On the education and employment challenges youth face, the Plan proposes increased funding for equal education access and the effective implementation and evaluation of youth employment and training programs, along with stronger multi-stakeholder coordination across the UN system, civil society, and governments for effective program and policy delivery. The Plan also highlights the need to empower youth with knowledge of worker rights and protections and for governments to enforce these provisions. The Braga Youth Action Plan builds on the priorities of the 1995 WPAY and elevates it as a framework for all states to use in developing national youth policies.

3.2.3 Sustainable Development Goals of the United Nations

With the adoption of the 2030 Agenda for Sustainable Development in September 2015, countries around the world committed themselves to achieving the Sustainable Development Goals (SDG) by 2030 (United Nations 2015). Youth are essential to achieving the SDGs and several SDG targets set objectives to improve employment and entrepreneurship outcomes for young people globally. To advance these youth employment and entrepreneurship outcomes, the UN has established initiatives for partnership and implementation, notably the Global Initiative on Decent Jobs for Youth (ILO 2017a) and Youth 2030: The UN Youth Strategy (United Nations 2023c).

SDG 4: Quality Education–Goal 4 centers on ensuring inclusive and equitable education and promoting lifelong learning opportunities for all people. Within Goal 4, Targets 4.3 and 4.4 focus on the need to equip youth and adults with relevant skills–including technical and vocational skills–for employment, decent work, and entrepreneurship, and to make such training and education affordable and accessible (The Global Goals 2023).

SDG 8: Decent Work and Economic Growth– Goal 8 aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all people. Among the goal's targets, Targets 8.5, 8.6, and 8.7 address the imperative to create decent work for youth. Target 8.5 calls for full and productive employment and decent work for all women and men, including for young people and persons with disabilities, with equal pay for work of equal value. Target 8.6 aims to reduce the proportion of youth



not in employment, education, or training. Target 8.7 is a call to action to eradicate forced labor, end modern slavery and human trafficking, and end child labor in all its forms. Lastly, Target 8.C involves the development and operationalization of a global strategy for youth employment and the implementation of the Global Jobs Pact of the International Labour Organization (ILO 2022b).

To advance these youth employment and entrepreneurship outcomes under the 2030 Agenda for Sustainable Development, the UN has established initiatives for partnership and implementation, notably the Global Initiative on Decent Jobs for Youth and Youth 2030, the UN youth strategy.

The Decent Jobs for Youth Initiative was launched at the 2016 Economic and Social Council (ECOSOC) Youth Forum as a multistakeholder platform to mobilize both UN and global partner action toward generating positive livelihoods for young people globally. The Initiative was created to advance the SDGs by recognizing the importance of youth as agents for sustainable development. Led by the ILO in partnership with other UN agencies and external global partners, the Initiative aims to contribute to achieving full employment and decent work for all youth by 2030 (ILO 2017a).

Youth 2030, the UN youth strategy, was launched in 2018 to promote youth engagement in advancing the SDGs. The strategy serves to, "guide the entire UN as it steps up its work with and for young people across its three pillars-peace and security, human rights, and sustainable development (United Nations 2023c)." Five key priorities are set out to shape the UN's approach to promoting the political, social, and economic rights of young people and for catalyzing national and local action for youth empowerment among member states. Among these priorities is a focus on economic empowerment through decent work. This priority involves a UN commitment to collaborate with member states and their development partners in improving the youth school-to-work transition through better skill development systems and improving access to productive resources and technologies for both rural and urban youth. Following the launch of Youth 2030, the UN established the Generation Unlimited (Gen-U) initiative to foster and mobilize partnerships to fulfill the priorities stated in the strategy. The Gen-U initiative aims to have every young person in education, other learning or training programs, or employment by 2030 (IISD 2018).

3.2.4 Lisboa+21 Declaration on Youth Policies and Programmes

Created in 2019 at the World Conference of Ministers Responsible for Youth, the Lisbon+21 Declaration offers a framework for a rights-based, human-centered approach to support the political, social, and economic empowerment of youth around the world (Republic of Portugal 2019). The declaration reaffirms previous global commitments, such as the 1995 WPAY, in recognizing the critical role youth play in sustainable development processes. Notably, the task of generating decent work and employment for youth is highlighted as one of the major challenges demanding global attention and effort. In response to this challenge, the Declaration lays out commitments to promote opportunities for decent and productive work for youth in relation to wages and sustainability, to advance youth entrepreneurship, and to bolster the employability of youth through adequate education and vocational training. Additionally, the importance of social protection and the promotion of international labor standards to ensure equal protection for youth are included.

3.2.5 UN Decade of Family Farming 2019-2028 Global Action Plan

Recognizing the prevalence of family farms in agricultural production globally, in 2017 the UN declared 2019-2028 to be the Decade of Family Farming. In line with this recognition, FAO and IFAD published the UN Decade of Family Farming (UNDFF) Global Action Plan as a framework to guide the development of national policies and investments that support family farming and advance the SDGs (FAO and IFAD 2019). As youth make important contributions of labor on family farms, among the seven pillars of the UNDFF Action Plan is that of supporting youth to ensure the generational sustainability of family farms. In particular, the plan urges support for young farmers by improving their access to land, information, education, infrastructure, financial services, markets, and policymaking processes, among other areas. The UNDFF Action Plan highlights how support to youth on family farms can help revitalize rural economies and contribute to several of the SDGs, including Goal 4 on quality education and Goal 8 on decent employment for young people.

To achieve the goals of the UNDFF Action Plan, FAO launched Participatory Communication Plans to amplify the voices of family farmers and to promote policies and programs that advance the UNDFF in Africa, Asia Pacific, and Latin America. In Africa, FAO and IFAD, along with civil society partners, support YenKasa Africa, a regional initiative to bolster knowledge sharing and communication for agricultural and rural development (YenKasa Africa 2023). The initiative brings together local community radio stations, media professionals, communication and development practitioners, academics, and civil society organizations to further the role of communication in spurring agricultural growth and rural transformation, with special attention to family farming and related issues. Additionally, FAO hosts the Family Farming Knowledge Platform, a digital information repository that provides knowledgebased assistance to policymakers, family farmers' organizations, development experts, and other stakeholders seeking to implement policies and initiatives in line with the UNDFF Action Plan (FAO 2021a). Since the launch of the UNDFF Action Plan, at least 53 countries have begun implementation of the plan recommendations, with 11 National Action Plans and three Regional Action Plans having been approved. Additionally, 200 new laws have been introduced or put in place globally to address some of the challenges facing family farms (Food Tank 2022).



4. LACK OF FORMAL EDUCATION, SKILL DEVELOPMENT, AND TRAINING ARE KEY OBSTACLES TO YOUTH EMPOWERMENT IN AFRICA

As established in the preceding chapters, the active involvement of young people in Africa's agrifood systems is essential for the continent's socio-economic development and prosperity. However, several obstacles continue to prevent African youth from pursuing meaningful, decent, and profitable opportunities in the agrifood sector (Mapanje and Mushongachiware 2022). These obstacles vary across regions and countries, within countries, and between rural and urban areas. The obstacles that girls or young women face also differ from those of boys or young men. Africa's youth are not a homogeneous group, and as such the challenges-and the solutions-vary. This chapter identifies some of the most significant barriers hindering youth empowerment in Africa's agricultural and food systems, focusing on education, skill development, and training.

For young people, the agriculture sector is often seen as outdated, unprofitable, and involving backbreaking work. Yet, this is not necessarily the case. Africa's agrifood systems are changing rapidly, are highly dynamic, and can offer many entrepreneurship opportunities for along agribusiness value chains (see Chapter 5). However, added to the negative perception of the sector, young people are hampered in their ability to harness the economic opportunities available within agrifood systems. They often lack the education and skills to do so. Governments and their partners must urgently address these challenges to ensure that Africa's large youth population becomes a demographic dividend that drives the continent's economic growth and development agendas. While this chapter focuses on building skills, Africa's youth also face other challenges that prevent them from realizing their economic potential in agribusiness (Text Box 4.1).

Text Box 4.1. Limited access to finance also constrains youth participation in agrifood systems

While this chapter focuses on barriers limiting the access of youth to education, skill development, and training, other economic challenges persist and remain equally important for them. One of the central constraints is limited access to finance. Without adequate and affordable financing to complement their education and vocational training, young entrepreneurs cannot thrive in the agribusiness marketplace to the degree that they can in other sectors. Capital is required to form viable farming businesses at all stages of enterprise development, so entrepreneurs must have access to financing and credit. Yet, financial support is often difficult to access due to the inherently risky nature of farming. Few young people use formal banking services. The consequent insufficient data on their financial management abilities further perpetuates the notion among lenders that they are risky customers. Access to microfinance must be made available for emerging enterprises, while bridging products are needed to address the 'missing middle'-those businesses that reach a level of growth beyond the capacity of microfinance to serve (Agriculture for Impact 2014). Establishing an enterprise is difficult. Perceived high-risk groups, including youth, often do not have enough collateral or other resources to raise funds. They may not own sufficient land or have formal rights to the land they own. Making microfinance more widely accessible to young people is crucial for enabling them to start and build successful enterprises in agribusiness value chains.

Limited skills, low levels of education or training that meet the demands of rapidly transforming labor markets, restricted access to market opportunities, and lack of institutional support all pose significant barriers to the economic empowerment of youth. Combined, these challenges prevent young people from leveraging their potential and building successful enterprises within agrifood systems. Currently, one in five of all young Africans have neither a job nor are they participating in education or training. The majority of these youth are women (Kubik 2022). For young people without access to higher education, vocational training and other skill development programs are instrumental to removing many of the barriers they face to establishing or finding employment in agrifood enterprises. Youth in the countryside are the most enthusiastic about creating their own agribusinesses—nearly one-quarter of rural youth plan to start a business, compared to 19 percent of urban youth (Agriculture for Impact 2014). These young people can benefit from targeted training, technical assistance, and mentoring. Adapting education curricula and skills training in rural areas to the particular needs of transforming agrifood systems would be an important step in supporting youth in becoming entrepreneurs along agribusiness value chains.

Despite expectations arising from the continental food systems transformation agenda outlined in the Malabo Declaration (African Union 2014) and the African Common Position on Food Systems (African Union and AUDA-NEPAD 2021), the required investments in human capital have not followed at a sufficient pace to tap into the potential for decent employment in Africa's agrifood sector. Unlike other rural economy sectors, like carpentry, mechanics, or tailoring, where the market requires the service provider to be skilled, the agrifood sector remains dominated by low or unskilled labor. For example, in 2012 the Rwanda Standards Board ordered the removal of local cheese from the market due to poor processing and handling. The ban was later lifted after training on food safety and hygiene for rural entrepreneurs by the Rwanda Ministry of Agriculture and Animal Resources. Successful entrepreneurship in dynamic value chains in the agrifood sector requires that the enterprise operators have the requisite skills.

4.1 Barriers to pursuing higher education and receiving training

While progress has been made in recent years in improving literacy rates and overall education levels, many African youth drop out of school at a young age. Many of those who are in school are not acquiring basic literacy and numeracy skills, with the poorest children being the most excluded. Barriers to pursuing formal education, vocational training, apprenticeships, or skill development programs severely limit the empowerment of youth and are in stark contrast to the Universal Declaration of Human Rights on the "Right to Education" (Article 26) and the "Right to work, to free choice of employment, to just and favorable conditions of work and to protection against unemployment" (Article 23).

Yet, the continent's young people can become an engine of economic growth and development if equipped with the right skills and knowledge. The transformative power of education is well known, increasing not only the productivity and employability of young people but also improving the overall well-being and economic development of the communities and countries in which they live (UNICEF and AUC 2021). African governments can capitalize on the demographic dividend their youth offer by accelerating investments in education and training to meet the sustained growth in the number of young people on the continent.

4.1.1 Restricted physical access to education and training

UNICEF and the African Union (2021) estimate that the number of out-of-school children in Africa has increased since 2010. In 2019, 105 million primary and secondary school-age children were not enrolled in school. This growing trend is mainly



due to the increasing number of out-of-school young people of secondary school age. Their number has increased by 12 million over the past two decades. Overall, 53 percent of young people in Africa who are at the right age to attend upper secondary school are not enrolled. This number varies regionally from 27 percent in Northern Africa to 61 percent in Eastern Africa. While some of these young people could be in employment, training, or apprenticeships, it is estimated that at least one-fifth are not.

Access to education is typically more restricted in rural areas than in urban areas. Although education systems are decentralized in most countries with smaller towns and villages providing primary education, secondary or tertiary educational institutions are primarily located in larger towns or cities. For training and skill development opportunities beyond the formal education system, such as through incubators, apprenticeships, or vocational training programs, access is even more restricted for young people living in rural areas. According to UNICEF and the African Union (2021), members of the richest quintile of households are eight times more likely to complete primary school and 12 times more likely to complete upper secondary than those from the poorest quintile. On average, two in five African children from poor families complete primary school, and only 6 percent complete secondary school. Additionally, only 12 percent of children in rural areas complete upper secondary education. This is coupled with an uneven distribution of government expenditure by level of education and schooling profiles in many African countries: In Guinea, the Central African Republic, Senegal, and Cameroon, children from the richest 20 percent of households were found to receive 37 percent of public education spending, almost four times that of their peers from the poorest quintile of households. This wealth disparity in African public education resources is much larger than the global average and must be urgently addressed.

Finally, patchy access to electricity and the internet further limits opportunities for Africa's youth, particularly those in rural areas or from poor households, to access information or to pursue online training opportunities. In addition, children from farming households may be taken out of school during busy agricultural periods to make up for seasonal labor shortages, thereby missing out on parts of the important formative schooling years (Hurst 2007, FAO, CTA, and IFAD 2014). Moreover, school curricula do not accommodate the traditional lifestyles of some farming communities, such as nomadic groups,

which has led to low enrollment and completion rates for young people in these communities, making it challenging for them to find suitable job opportunities (FAO 2018a).

The decline in access and completion rates of secondary and tertiary education emphasizes the need for non-formal education, especially for rural and marginalized communities. Many young people working in agriculture have only completed primary school or have received no education at all (FAO, CTA, and IFAD 2014). Nonformal educational programs are expected to fulfill multiple purposes, including serving as a substitute for formal schooling for those who lack access, providing additional training for those who require it for employment purposes, and enhancing the skills of those already employed (Sheffield 1972). Nonformal education is often considered secondary to formal education. Yet, it is crucial for economic empowerment and can serve as an additional means of achieving the goal of Education for All in Africa. There are many examples globally in which vocational training or dual education systems have significantly contributed to stimulating economic growth and enhancing the employability of young people (see Chapter 6). One of the most wellknown and successful dual education systems is found in Germany. This has been replicated in several other countries (Euler 2013, Pilz and Wiemann 2021).

4.1.2 Limited technical and vocational education and training opportunities

Globally, the expansion of quality technical and vocational education and training (TVET) has been prioritized through SDG 4.3-"By 2030, ensure equal access for all women and men to affordable and guality technical, vocational and tertiary education, including university"-and SDG 4.4-"By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship". At the continental level, the African Union's Continental Education Strategy for Africa (see Chapter 4) includes the expansion of TVET as one of its strategic objectives, namely to "expand TVET opportunities [...] and strengthen linkages between the world of work and education and training systems" (African Union 2016). However, TVET opportunities remain low across the continent. In 2019, about 10 million young people were enrolled in technical and vocational secondary education-on average, the percentage of youth aged between 15 and 24 years that are enrolled in vocational education is a meager 3 percent. The low level of TVET development can be explained by inadequate funding and the challenges in governing the subsector, which inherently requires a cross-sectoral and crossdepartmental approach at the government level (UNICEF and AUC 2021). However, as Chapter 6 demonstrates, there are significant opportunities for TVET in different segments of agrifood systems.

4.1.3 Quality assurance

African governments have increasingly created national quality assurance agencies for education over the past 30 years (Kraybill, et al. 2019). Central to these efforts is the African Quality Assurance Network, which was established in 1967 by the Association of African Universities. The network as of 2021 had academic quality assurance bodies in over 20 African countries (AfriQAN 2021). These national bodies set minimum academic standards for higher education, approve the establishment and accreditation of new institutions and programs, and monitor their performance. Many governments require universities to adopt and implement quality assurance policies. Moreover, the African Union in 2015 called on African governments to harmonize higher education systems and programs to facilitate collaboration among universities and other research institutions, enable the mobility of students and research staff, and facilitate the transfer of academic credit between institutions. Two regional associations focus on quality assurance: the African and Malagasy Council

for Higher Education (CAMES), with 19 member countries, and the Inter-University Council for East Africa (IUCEA), which grew from 33 institutions in 2000 to 127 in 2019. At the continental level, the Association of African Universities and the AU jointly promote quality assurance through the Harmonization of African Higher Education Quality Assurance and Accreditation initiative (African Union and the European Commission 2023). In addition, the rapidly evolving challenges of the agrifood sector and associated technological changes mean that universities must be able to learn and respond promptly and effectively in the face of this dynamism. There is widespread consensus that university agriculture education currently tends to be overly theoretical or outdated. Hence, there is an urgent need for agricultural curricula and research programs to better reflect in their design needed agrifood sector skills.

4.2 The growing mismatch between supply and demand of skills

Generally, the lack of effective career guidance in schools and insufficient promotion of agriculture as a subject of study lead to low interest among African youth in agriculture (Unay-Gailhard and Brennen 2022). Indeed, most education systems on the continent currently do not adequately prepare young people for the job market or provide them with the necessary skills for Africa's development (Obonyo 2022). Many young people working in



the agrifood sector received no education or have only completed primary school (FAO, CTA, and IFAD 2014). In rural areas of Africa with limited educational opportunities, agriculture employs about 60 percent of youth, with the majority in jobs that require low-level skills and for which wages are low (FAO 2018a).

There is also a disconnect between agricultural education and practical application, as individuals who achieve higher education levels tend to desire higher-skilled jobs outside of the agrifood system (Robinson-Pant 2016). With more children attending school across Africa, predictions suggest that by 2030, 59 percent of those aged 20 to 24 years will complete secondary education–137 million young people–and 12 million will complete tertiary education (AfDB, OECD, UNDP, and UNECA 2012). Moreover, rising primary school completion rates drive increased enrollment in secondary education. This is expected to double by 2030, resulting in an additional 46 million secondary students (Mastercard Foundation 2020).

Despite growing school attendance in Africa, the most educated people often face a mismatch

between the training they have received and available employment opportunities. The skills they acquire often do not align with those demanded by a transforming agriculture sector (OECD and ILO 2018). In 2015, only 2 percent of African university students studied science, technology, engineering, and math subjects related to agriculture, forestry, fisheries, and veterinary studies, all of which are important for future job opportunities (AfDB 2020). Additionally, of those enrolled in agriculture-related degrees, many often lack the practical skills and competencies entrepreneurship necessarv for pursuing opportunities in agriculture (Udemezue 2019). A study conducted by AfDB in ten African countries showed that skill and educational mismatches are prevalent in Africa: 17 percent of employed youth were found to be overskilled (overqualified), 29 percent underskilled (undergualified), 8 percent overeducated, and 57 percent undereducated (Text Box 4.2). Underskilling is particularly prevalent in Madagascar (42 percent), Benin (41 percent), and Liberia (37 percent), in contrast to countries like Egypt, where less than two percent of youth are underskilled (Morsy and Mukasa 2019).

Text Box 4.2. Underemployment and mismatches in skills and education

Underemployment: When a person is employed, but not in a desired capacity in terms of skills, experience, or compensation.

Skill mismatch: When an employed youth has a job for which the skill requirements do not correspond to the youth's actual or self-perceived skills. Measuring skill mismatch is particularly challenging because not only there is no internationally agreed classification of skills or standard measure of skills, but also different occupations may require different types of skills. Also, the skills needed for the same occupation might change over time as some skills become obsolete.

Educational mismatch: When a worker's level of education does not correspond to the required level of education to perform his or her job or when the individual's field of study is different from the field of study required for the job.

Although sometimes used interchangeably, skill and educational mismatches do not refer to the same phenomenon-two workers with the same level of education may have completely different levels of skills and abilities. In addition, while people's level of education rarely changes once they have completed their formal education and have started working, their skills can change and expand substantially during the course of their work lifetime through on-job training, experience, self-learning, etc. (Morsy and Mukasa 2019).

According to the World Bank Enterprise Survey, about one-third of firms in Africa report skills shortages as being a "greater-than-average constraint" on their operations. In Tanzania, for instance, 40 percent of all firms consider the region's inadequately skilled workforce to be a significant constraint to their business growth, while, in Kenya, this is the case for 30 percent of all firms. The impact in Africa of unskilled and underskilled labor hinders the achievement of food system transformation goals on the continent.

Although African countries are increasingly investing in technology and knowledge-intensive technologies, including irrigation technologies, farm machinery for processing, and horticulture, there are few targeted strategies or policies in place for accompanying skills development. It is common to see broken-down tractors in villages due to a lack of repair facilities or nonoperating irrigation schemes due to a lack of skills in the locality to maintain and operate them profitably. A recent study on skills in mechanization and automation in agro-processing in Ethiopia, Kenya, Nigeria, and South Africa found that only 28 percent of staff in the firms sampled were qualified to work with machinery or with automated systems (Baumüller, Kubik and Getahun 2023). Automated firms reported skills gaps of 52 percent and mechanized firms reported skills gaps of 40 percent. The study also showed that the most frequently needed skills in mechanized and automated factories are technical skills related to machine operations and computer use. At the same time, several African countries, such as Ethiopia, have designed policies and incentive packages to attract foreign direct investment to close the funding gap in agriculture and promote intra-continental and global export trade. Such investments have resulted in large, mechanized, automated farms being established that require skilled labor for land preparation, crop management, sorting, grading, packaging, and the like. Insufficient availability of workers with the required skills locally hampers not just the optimization of large agricultural investments but also the economic attractiveness of such investments. It also impacts the profitability of smallscale commercial farming while at the same time depriving young people of potentially profitable employment opportunities in the agrifood system.

Improved human capacity will be crucial to increasing the use of digital and complex mechanical technology across agrifood systems. Evidence shows that countries South of the Sahara continue to reap low benefits from digitalization. Experience from other regions of the globe shows that Africa must quickly develop a targeted approach to digital skill development and digital literacy readiness, including policies to encourage innovation and entrepreneurship to meet local demand for these skills.

In summary, young people generally are dynamic, inquisitive, and challenging. They create a distinctive culture everywhere and are innovative, often inventing new forms of work independently. Young entrepreneurs are also more likely to hire fellow youths, pulling even more youth out of unemployment and poverty. They are particularly responsive to new economic opportunities and trends, so are active in high-growth sectors. Entrepreneurship offers unemployed or discouraged youth an opportunity to build livelihoods. High-quality school sustainable and university programs, particularly in applied sciences, technology, and engineering, could significantly increase Africa's competitiveness, productivity, and growth (see Chapter 6). Over 72 million young people in Africa, particularly young women, who are not now in school need to be receiving training so that they can find good jobs.

Addressing this is crucial for African countries to achieve SDG 8 on creating decent work opportunities for all by 2030. Africa's youth need access to high-quality training to develop the necessary skills demanded in local job markets, specifically in the agrifood sector. Expanding successful comprehensive approaches is essential, along with specialized training in agriculture and sustainable practices, such as business and soft skills and information technology. Such comprehensive training is provided in many countries through Youth and Junior Farmer Field and Life Schools (FAO 2012) and in Benin through the methodology used by the Centre Songhaï (Centre Songhaï 2023). Mentoring programs will also be valuable to young entrepreneurs in Africa's agrifood sector. Additionally, there is a need to improve the overall business environment by supporting the private sector to create more jobs and by strengthening agribusiness organizations (FAO 2018a).

5. SOLUTIONS TO ADVANCE YOUTH ENGAGEMENT IN AFRICAN AGRIFOOD SYSTEMS

Nearly 16 million young Africans are facing unemployment. In a context where an average of 11 million young people join the African labor market and only 3.7 million jobs are created annually, this figure is set to rise. Despite being confronted with a formidable set of challenges, Africa's youth are full of energy, creativity, and potential that is yet to be unleashed at scale. By creating rewarding and meaningful employment opportunities in the agrifood sector, coupled with the necessary development and skill training, African governments and their partners can unlock both the transformative potential of their youth and the dynamism of their agrifood systems. This chapter highlights the employment opportunities for young people across all segments of the agrifood system, ranging from opportunities in science and research upstream from the farm, on the farm, in the processing sector, and through engagement with domestic, regional, and international markets. To harness these opportunities, young people must be equipped with the skills and knowledge that match those demanded by rapidly transforming food systems. Such training must also go beyond formal education systems. Moreover, drawing young people to pursue employment in agrifood systems will also require their active involvement and participation in political decision-making processes and policy design.

Agrifood value chains intermediate the flow of products between largely rural farmers, fishermen, or herders and increasingly urban consumers (Barrett, et al. 2022). Such value chains have transformed in recent years, supplying an increasing volume and diversity of food products to fast-growing urban and peri-urban areas and increasing demand from richer and more urban consumers for a wide variety of higher-quality and usually more expensive food items (Minten, Belton and Reardon 2023). This transformation in Africa's agrifood systems provides significant employment opportunities for youth. This section explores those opportunities along the segments of the agrifood value chain, including the preproduction, production, processing and value addition, and marketing segments.

5.1 Pre-production

The pre-production segment of agrifood value chains offers numerous opportunities for young people to unleash their creative potential, ranging from the design and development of new technologies and innovative tools, including crop breeding and biotechnology, to information-sharing using digital platforms to provide weather forecasts or crop management or animal husbandry advice to farmers. This section provides an overview of these opportunities for young people and examples of initiatives where employment and enterprise creation opportunities in this segment of agrifood value chains have been fostered.

5.1.1 Science, Technology, Engineering, and Mathematics (STEM) Education

Transformation of food systems is crucial to sustainably provide food security and healthy nutrition for everyone within the context of a rapidly growing world population. This transformation requires the development of innovative agricultural technologies, such as new crop varieties that are resistant to pests and climatic shocks like drought and digital tools and machines. The development and application of these technologies involve the utilization of STEM in fields that include biology, engineering, computer programming, information and communication technologies (ICT), artificial intelligence, and machine learning. However, less than one-quarter of higher education students in Africa pursue STEM-related career fields. Increasing the enrollment of young people in STEM education can provide them with increased job opportunities in transforming agrifood systems.

Strategies to attract more youth to STEM fields are urgently needed. This can be through promoting a science culture in African societies by highlighting how science is critical to meeting societal needs or overcoming challenges. The applicability of what is taught to solve societal problems will increase the interest of youth in STEM subjects and, consequently, elevate prospects for job creation and employment in agrifood systems. To achieve this, many African governments, including Rwanda, South Africa, Mozambique, Zambia, Zimbabwe, and Tanzania, have reviewed and revised their STEM curricula using project and competency-based criteria that aim at promoting creativity and innovation, as well as ensuring that skills that are more relevant for the job market are built (M'mboga Akala 2021, United Nations 2022a). Another approach governments have pursued is to strengthen the quality of innovative STEM approaches in education. An example of this is the technology-enabled education curriculum developed in Rwanda (Text Box 5.1). This curriculum reform has improved the methods used to teach STEM subjects and strengthened student-teacher interactions.

Text Box 5.1. Rwanda's Success in Improving STEM Education

Critical sectors for socio-economic development in Africa such as agriculture, energy, environment, health, and water can be significantly impacted by science, technology, and innovation through training in science, technology, engineering, and mathematics (STEM). Rwanda is one of the African countries that has recognized the significance of STEM and subsequently revised curricula in its schools to make STEM education a critical pillar of the education system. The Government of Rwanda has increased infrastructure investments in support of such training, such as well-equipped laboratories for more practical STEM education (AUDA-NEPAD 2021c).

In 2019, Rwanda introduced competence-based curricula from pre-primary to upper-secondary levels that included adapted STEM and information and communication technologies (ICT)-led methods. This curriculum reform has helped to interest young people in STEM from an early age. In implementation, Rwanda's Ministry of Education partnered with technology-enabled companies, such as Microsoft and Zora Robotics. ICT-led education has been successful, with ICT courses now being taught in 55 percent of Rwanda's secondary schools. The ICT tools put in place under these curricula reforms enable students to collaborate and easily communicate with their teachers through the digital technology platforms established.

To increase the interest of young people in STEM, Rwanda's education policy emphasizes building teachers' capacity through expanded training in improved pedagogical skills that will enhance for students the linkages they see between classroom learning and real-world problems. This continuous capacity building also aims to increase the number of qualified STEM teachers in Rwanda to fully meet the country's needs. These measures have improved STEM education uptake in Rwanda (AUDA-NEPAD 2021c).

At the tertiary level, Africa's universities need to expand their curricula to include programming and algorithm design so that they can become hubs of digital innovation for Africa's agrifood systems. Universities should also introduce technical and vocational education and training (TVET) to equip young people with the specific digital skills needed to efficiently use and develop new agricultural technologies and digital services for use along agrifood value chains. Doing so would provide new job opportunities, including in the design and development of software and hardware, the maintenance and repair of ICT systems, the deployment and integration of drones and sensors, and data analysis (Malabo Montpellier Panel 2019). Approaches outside traditional agricultural education contexts

can also be applied, such as using school gardens as a venue for STEM learning, creating community-based STEM programs for urban youth to introduce them to improved agricultural techniques, and holding competitions aimed at advancing innovations in agricultural technology (Scherer, et al. 2019). These approaches, however, require collaboration between governments, agrifood systems researchers, teachers, and the STEM-education sector at large. As an example of such collaboration, in 2017 Uganda's Ministry of Agriculture, Animal Industry and Fisheries and partners established the Youth Inspiring Youth in Agriculture initiative (Text Box 5.2), through which youth compete nationally in developing innovations in the agrifood value chain (FAO 2019).

Text Box 5.2. Uganda's Youth Inspiring Youth in Agriculture (YIYA) Initiative

This YIYA initiative is a country-wide competition aimed at promoting youth employment in the agricultural sector by fostering role models of young agricultural entrepreneurs who are willing to work with and support their peers through mentorship, knowledge-sharing, and capacity-building. The initiative was established in 2017 by the Ministry of Agriculture, Animal Industry and Fisheries in collaboration with FAO and with support from other government agencies, such as the Bank of Uganda. Among the 500 youth nationally who applied to participate in 2017, 25 were awarded for having developed innovations in agricultural value chains. The Youth Champions (YC) were awarded cash support and opportunities to attend technical trainings, network among themselves, exhibit their agricultural products, and participate in policy dialogues related to youth employment in agriculture. They also acquired national visibility. The YCs were empowered through their agriculture and agribusiness enterprises to function as role models in their communities to inspire other young people (FAO 2019).

An impact evaluation conducted by FAO in 2019 found that the YCs were able to significantly increase the capital they could access for their agribusinesses. For example, one of the YCs won a USD 250,000 grant from the U.S. African Development Foundation in 2019, having been aided by proposal writing training provided by YIYA (Ose 2021). The agribusinesses of the YCs were also able to create employment for fellow youth–the number of workers employed by 19 YCs increased from 143 in 2017 to 324 in 2019, of which 90 percent were youth. The success of the initiative was further demonstrated by the much higher number of applications–over 1,400–received for the YIYA competition in 2021. In this second cohort, 270 youth champions were selected–35 national and 135 district champions). These young entrepreneurs were given national visibility and provided opportunities to engage in peer-to-peer support activities with other youth. The 35 national champions were further awarded with equipment and assets, like animals and inputs. All gained visibility and support to access further opportunities (FAO 2022b).

Many students are hesitant to pursue STEM subjects because of the perceived difficulty of the studies. These perceptions are imparted to them through primary education and, at times, socio-cultural norms and traditions. This particularly holds for girls. Thus, improving the training of teachers in STEM to make the subjects more enjoyable and strengthening STEM capacity at schools and other training and educational institutions is required. Increasing the number of STEM teachers who use a STEM-friendly teaching approach with improved teaching skills and technology-driven smart classrooms will attract more young people into STEM courses. This can be achieved through initiatives such as the Teacher Training Program of the African Institute for Mathematical Sciences (Text



Box 5.3), which has been established in Rwanda, Cameroon, Ghana, and South Africa (AIMS 2021). Improved working conditions for retaining STEM teachers are also crucial to ensure that young people receive the training necessary to equip them with the skills they need (Chen 2022).

Text Box 5.3. Teacher Training Program of the African Institute for Mathematical Science

The Teacher Training Program (TTP) is a five-year program that was established by the African Institute for Mathematical Sciences (AIMS) in South Africa in 2003, Cameroun and Rwanda in 2018, and Ghana in 2020 in partnership with the MasterCard Foundation. TPP trains teachers and master trainers (experienced teachers who, in turn, train other secondary school teachers) to strengthen the delivery of mathematics and science content at the secondary level nationally. The program aims to develop a rich scientific talent pool in Africa. TTP uses the Mathematics and Sciences for Sub-Saharan Africa (MS4SSA) approach to cover content, pedagogy, infrastructure, and assessments to enhance the learning outcomes for mathematics, physics, chemistry, and biology among male and female secondary school students. The program is conducted through professional development courses, the use of high-quality classroom resources, and technology-driven smart classrooms, which makes learning in science, technology, engineering, and mathematics (STEM) more interesting to youth.

A complementary program, the Master of Mathematical Sciences for Teachers, was launched by AIMS in 2020 in Ghana to equip teachers with the requisite skills to understand and address the specific learning needs of learners at the secondary level through a hybrid model that is 30 percent residential and 70 percent online. This flexible training model increases the enrollment of teachers into the program.

TPP aims also to increase students, especially girls, transitioning into STEM fields at the tertiary university level. This is done through training teachers in the use of innovative gender-responsive teaching approaches and conducting outreach and public engagements to change attitudes and challenge stereotypes around girls in STEM. The program has been successful. Over 5,000 teachers have been trained across the four countries. In Cameroun alone, 588,000 students have benefitted from TTP, more than 40 percent of whom are girls (AIMS 2021).



African countries recognize the importance of empowering women, in particular, to contribute to agrifood systems transformation for poverty eradication and zero hunger (Malabo Montpellier Panel 2023a). At the tertiary level, the share of African graduates in STEM that are female has increased over the years, attaining 47 percent in 2023 (UNECA 2023b). Despite this progress, some STEM subjects are still male-dominated. Women are under-represented in research and development institutions, making up only 32 percent of scientists at them. This results in inequality in job opportunities (UNESCO 2020). The gender gap in STEM is partly due to the myth that boys and men are better at math and science, few early interventions to get girls and young women excited about STEM, limited female role models in STEM, and socio-cultural barriers. This gender gap can be reduced by establishing programs designed to spark the interest of girls in STEM fields from an early age, such as the Visiola Foundation (Visiola Foundation 2021) (Text Box 5.4), and increasing training for teachers on gender-sensitive instruction and how to engage girls in STEM through programs, as is done under the gender-responsive Teacher Training Program of the African Institute for Mathematical Sciences (AIMS 2021) (Text Box 5.3).

Text Box 5.4. Visiola Foundation-empowering African girls through STEM education

The Visiola Foundation, headquartered in Nigeria, empowers African girls through STEM education. The foundation works to support the emergence of a new cadre of African leaders by mentoring and training young women in the science, technology, engineering, and mathematics (STEM) fields (Visiola Foundation 2021). Visiola programs aim to encourage more girls to pursue careers in STEM by gaining their interest early, building their confidence, and facilitating their success. Visiola Foundation also supports female entrepreneurial leaders by equipping them with innovative technical skills, such as programming and coding, which will enable them to lead Africa's long-term socio-economic transformation (Malabo Montpellier Panel 2023a). The foundation's After-school STEM Clubs for Girls program focuses on training girls in problem-solving skills with the aim of producing female leaders who are committed to community transformation through science and technology.

A Mastercard Foundation study showed that girls and women will develop an interest in STEM topics when they understand the potential applications of such knowledge. However, many girls drop themselves out of STEM education paths because they found that the higher they pursued their education, the less they felt a sense of belonging in the STEM fields. Hence, these women thought that choosing a career that could be merged with marriage and family demands was better than what STEM fields of study would lead to (Mastercard Foundation 2023). Therefore, mentorship programs that expose young female scientists to women professionally working in STEM who can serve as role models for these students provide an opportunity to inspire them to choose and stay in STEM education and career paths.

Text Box 5.5. UNESCO and Government of Kenya STEM Mentorship Programme for Girls

Science, technology, engineering, and mathematics (STEM) mentoring programs aim to generate interest and excitement in these fields of study, leading to successful STEM careers. The UNESCO and Government of Kenya STEM mentoring program recognizes the need to bring on board different actors to expose secondary school girls to all facets of STEM (UNESCO and GoK 2021). Activities under the program include career talks in STEM, exposure to STEM learning environments and industry, application of coding and robotics, and testing students' skills in STEM by applying that knowledge to creating innovations to solve societal challenges. Almost 1,500 secondary school girls were mentored in eight UNESCO/GoK STEM Mentorship Camps between 2014 and 2020.

Upon completion of their Kenya Certificate of Secondary Education (KCSE), the courses pursued by the mentored girls at tertiary institutions were in mathematics at 37 percent, in medical-based programs at 27 percent, and in other STEM topics at 18 percent. The students who had transitioned to tertiary education were happy with the mentorship program with all rating it as 'very good' or 'good'.

A challenge encountered globally has been the retention of girls and women in STEM career pathways. However, all the students who had joined tertiary education after the mentorship program stated that they intended to stay and pursue their careers in STEM (UNESCO and GoK 2021). This shows that mentoring girls early can increase their enrollment and retention in STEM education and careers. Examples of programs that mentor girls and women to take on leadership roles in STEM include the UNESCO and Government of Kenya STEM mentorship program (UNESCO and GoK 2021) (Text Box 5.5) and the AIMS and Government of Ghana Girls in Mathematical Sciences Fellowship Program (Text Box 5.3) (Babalola, du Plessis and Babalola 2023). In the agrifood sector, mentorship and promotion of female role models in agrifood research aimed at inspiring more women to the sector have been provided by initiatives like the African Women in Agricultural Research and Development (AWARD 2021) (Text Box 5.6). Such efforts, however, should be facilitated through offering research funding specifically for women. as well as policies that improve childcare support (Malabo Montpellier Panel 2023a). More collaborations between government agencies and non-government organizations should be established to increase the number of female scientists in top positions in the agriculture sector.

Text Box 5.6. African Women in Agricultural Research and Development (AWARD) fellowship program

AWARD is a career-development program established in 2008 for top African women scientists. It aims to increase their contributions to agricultural research and development and bridge the gap in women holding management positions in higher education and agricultural research institutions. AWARD offers two-year fellowship packages in partnership with universities and other research organizations to mentor and build the science and leadership skills of high-potential graduate female agricultural scientists so that they can deliver agricultural innovations across Africa's agricultural value chains (AWARD 2021). The success of the program is evidenced by an evaluation study conducted in 2017 on the effectiveness of the program on science capacity. 86 percent of 122 female AWARD fellows saw quantitative changes in their capacity to conduct gender-responsive research, fundraising for research, and present research findings (Malabo Montpellier Panel 2023a, Mukhebi, et al. 2017).

African countries have made some efforts in collaborating to develop policies, strategies, and programs to provide youth with digital skills and tools for employment and leadership, as well as an enabling environment for self-employment and entrepreneurship. For example, in 2018, an African Ministerial Forum on "Youth Skills and Enterprise in the Digital Age" brought together senior policymakers, development partners, the private sector, African youth representatives, young entrepreneurs, and civil society. This meeting was held to share and discuss comprehensive and innovative TVET models and programs to develop the leadership and digital skills of the youth and to equip them with the necessary knowledge and tools to design marketable products and services and, therefore, create sustainable enterprises and generate employment (Malabo Montpellier Panel 2019).

5.1.2 Research and Development

In 2006, the Executive Council of the African Union endorsed the call for member states to increase their national gross expenditure on research and development (GERD) to at least 1.0 percent of their GDP. The aim of this target is to increase innovation, productivity, and economic growth (UNECA 2018). However, in 2022, no African country had met the target, with the highest performer being South Africa at 0.85 percent. This is in stark contrast to other regions like Asia, where South Korea spends 4.5 percent of its GDP on GERD and China spends 2.1 percent (Statista 2023b).

Despite the low performance on public investment in research and development by the African Union member states, the 2021 third Biennial Review for tracking progress on the 2014 Malabo Declaration commitments showed that 21 out of 42 countries are on track towards investing at least one percent of their agricultural GDP in agricultural research and development (African Union 2022). This is an improvement from the 12 states recorded in the 2019 second Biennial Review (African Union 2020d). There is an urgent need to sustain this positive trend and to further increase funding to support agricultural research for development. Such funding is necessary to ensure that Africa's researchers and scientists can leverage their potential while also reducing the brain drain of well-trained Africans to research centers outside the continent.

Increasing investment in agricultural research and development in Africa would result in greater economic self-reliance, economic diversification, employment, and wealth creation. Public-private partnerships can invest in youth to develop innovations in agrifood systems that can lead to green job creation. An example of such investments is the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). This network was created to support African universities
in contributing to the implementation of national CAADP investment plans and facilitate the transformation of higher education in agriculture across Africa (Osiru and Adipala 2016). The aim of RUFORUM is not only to produce graduates

who are employable but also to create expanded employment opportunities in rural areas for community transformation through agriculture and agricultural value-addition (Text Box 5.7).

Text Box 5.7. RUFORUM's investment in agricultural research among African universities

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is a continental platform for African higher education in agriculture that networks 60 universities operating in 25 African countries. Its mission is to "strengthen the capacities of universities to foster innovations responsive to the demands of smallholder farmers and value chains through the training of high-quality researchers, the output of impact-oriented research, and the maintenance of collaborative working relations among researchers, farmers, market actors, national agricultural research and advocacy institutions, and governments (Osiru and Adipala 2016)".

By 2021, with funding from the Rockefeller Foundation and the Carnegie Corporation, RUFORUM had supported the training of over 3,000 students-more than 600 PhDs, 2,000 MScs, 200 undergraduates, and 300 technologists. Almost all of the graduates (98 percent) are working in their home countries across all regions of Africa. Some have been promoted to lecturer or professor roles within their universities (RUFORUM 2021).

Africa's agriculture research and development can be further increased through collaborations between AU member states. The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) brings together scientists from the national agricultural research institutions and the national agricultural extension service providers of its fifteen member countries, as well as development partners, to generate, share, and promote knowledge and innovations to solve agriculture problems in the member states (ASARECA 2023) (Text Box 5.8). The association has contributed to increasing the number of trained researchers in agrifood systems by providing full or partial scholarships for postgraduate students.

Similarly, the Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles (CORAF–West and Central African Council for Agricultural Research and Development, WECARD), established in 1987, is a not-forprofit association that works in partnership with the national agricultural research systems from 23 countries in West and Central Africa. These partners include public agricultural research institutes, universities and other tertiary institutions, farmer groups, civil society organizations, the private sector, and any other entity engaged in the provision of agricultural research services (CORAF 2021). Finally, the Centre for Coordination of Agricultural Research and Development for Southern Africa was launched in 2011 by the SADC member states to harmonize the implementation and address issues of agricultural research and development in the fifteen countries of the SADC region, in partnership with national, regional, and continental institutions (CCARDESA 2018).



Text Box 5.8. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)

ASARECA is a sub-regional organization established in 1994 by the National Agricultural Research Institutes of the ten original member-states. ASARECA now is made up of 15 member-states–Burundi, Cameroun, Central African Republic, Democratic Republic of Congo, Eritrea, Ethiopia, Federal Republic of Somalia, Kenya, Madagascar, Republic of Congo, Rwanda, South Sudan, Sudan, Tanzania, and Uganda. ASARECA complements the efforts of its member-states through sub-regional level collective action and cost-effective utilization of resources for improved delivery and impact of scientific knowledge, policy options, and technologies to drive the sub-region towards meeting the objectives of the Comprehensive African Agricultural Development Program (CAADP). ASARECA's mission is to enhance collective action in the sub-region in agricultural research for development, extension, and agricultural training and education to promote economic growth, fight poverty, eradicate hunger, and enhance the sustainable use of resources (ASARECA 2023).

ASARECA also provides funding for postgraduate students to develop expertise in topics relevant to the expansion and transformation of agrifood systems. Between 2010 and 2014, the East African Agricultural Productivity Programme project fully funded 75 MSc students and 36 PhD candidates (19 percent were female PhD students). An external evaluation in 2015 also demonstrated that 138 new crop varieties were developed under the project, including new varieties of cassava, rice, wheat, and forage crops (ASARECA 2016). Twenty-three new varieties have been disseminated across national boundaries, including two Tanzanian rice varieties released in Kenya and Uganda, cassava with enhanced carotene released in Ethiopia, Tanzania, and Kenya, and assisted reproductive technologies from Kenya sent to other countries. The project evaluation found an increase in the adoption of new varieties, breeds, and other selected management practices by farmers from 35 percent to 53 percent in project areas (ASARECA 2016).

Crop breeding and biotechnology

Agricultural production is challenged by climate change-associated extreme weather events and by pests and diseases, whose spread is often determined by weather conditions. The lower production that results increases food insecurity (UNCTAD 2017). Agriculture also relies heavily on land, water, and other natural resources, all of which are also affected by climate. Agriculture research, particularly improved and modernized crop breeding, can contribute to ending hunger and malnutrition through the development of climate-resilient and nutrient-rich crops. For example, orange-fleshed sweet potatoes are rich in beta-carotene. The crop not only helps to prevent vitamin A deficiency but is also relatively tolerant to drought. It can be used by producing households in versatile ways due to having edible roots, leaves, and vines. It also is early-maturing, which enables farmers to grow the crop two or three times per year (CIP 2020). Crop breeding and other biotechnology-based activities provide important employment opportunities for youths.

Skills in this field can be used to develop crop varieties that better meet societal needs-for example, varieties that reduce drudgery in the preparation of foods, provide increased yields, have improved taste or nutritional content, or take less time to mature and require less water. For example, Prince Matova, a young breeder from the Crop Breeding Institute of the Ministry of Agriculture in Zimbabwe, received an award from the International Atomic Energy Agency and FAO for developing Zimbabwe's first cowpea variety developed with a nuclear technique. This cowpea variety can be grown in arid and semi-arid regions of Zimbabwe (IAEA 2021).

Moreover, since most farming and home food preparation work is done by youth and women, if more youth can access new crop varieties that reduce drudgery-those that require less weeding, are easy to process, or are quick-cooking-they can use them to create their own commercial enterprises within local crop value chains. For example, new cassava varieties that peel and cook easily were reported to reduce drudgery from household chores and crop production in Nigeria (Teeken, et al. 2018). The resulting time savings and quality of life improvements allowed youth to better focus on their own education or on higherpaying activities (CGIAR 2023).

Increased development of crop varieties by youth can be enhanced through investments by national and regional organizations in research training among young scientists or through programs such as the RUFORM (Text Box 5.7) and ASARECA (Text Box 5.8). The unavailability of basic seeds for many National Agricultural Research Institutes constrains the production phase of the seed supply chain for improved crop varieties (African Union 2021). Therefore, this provides an opportunity for youths to establish companies where they can also employ their peers to produce and supply basic seeds. Public-private partnerships can train youth through seed business innovation hubs to produce basic and certified seeds and to develop new crop varieties. For example, the CGIAR, in partnership with National Agricultural Research Systems, helps to integrate more youth and women into seed production enterprises through various projects in African countries (CGIAR 2022, ICRISAT 2022) (Text Box 5.9).

Text Box 5.9. ICRISAT-integrating youth and women into seed production enterprises in Tanzania

The International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), a CGIAR research center, works with private seed companies to integrate more women and youth into seed production enterprises in Tanzania. ICRISAT supported a seed company called Mbozi Highlands (MHEG), to enhance the production, promotion, marketing, and adoption of new high-yielding varieties of groundnut and sorghum. This was done through developing manuals to train farmers, identifying and contracting 92 new seed producer groups of youth and women; facilitating inputs for the groups; and identifying areas suitable for 300 variety demonstration plots. MHEG also worked closely with women and youth groups to develop and sustain seed business hubs for groundnut and sorghum in the Southern Highlands of Tanzania. In 2020, eight women and youth seed producer groups produced, cleaned, and delivered 1.2 and 4.8 tons of certified groundnut and sorghum seed to MHEG. ICRISAT also provided financial and technical support to train seed and grain farmers for greater adoption of new varieties. The partnership between ICRISAT and MHEG has contributed to the creation of vibrant seed systems in Tanzania and enhanced livelihoods for women and youth (ICRISAT 2022).

Agricultural biotechnology or genetic engineering has considerable potential that remains to be unleashed. Youth can take on careers in genetic engineering to innovate sustainable agricultural practices for increased agricultural productivity. Examples of what they might do include developing crops that can express toxins similar to organic pesticides in order to control pests, leading to a reduction in costs on labor, pesticides, equipment, and fuel. Youth can also develop innovative fertilizer technology to reduce the usage of inorganic fertilizers and improve soil quality. These include cost-effective phytoremediation technologies, which is a plant-based approach to extract and remove elemental pollutants or lower their bioavailability in soil. These biotechnologies help conserve natural resources, enhance nutrient utilization by plants, reduce nutrient runoff, and increase soil organic carbon sequestration, while at the same time increasing agricultural productivity by producing hardier crops that thrive in harsh environments with lower levels of fuel, labor, fertilizer, and water (Das, et al. 2023, Rehman, et al. 2016, Yan, et al. 2020).



5.2 Production

Chapter 4 discussed some of the challenges that prevent young people from playing an active and meaningful role in Africa's food systems. Increasing access to labor, finance, land, equipment, and new technologies can greatly improve the attractiveness for young people of careers in the agrifood sector, as well as enhance overall agricultural productivity, production, and income. Given the large contribution that agriculture makes to the GDP of African countries, addressing the challenges to youth engagement in factors of food production can have large benefits for national income. Currently, most jobs in Africa's agrifood sector-that includes production, manufacturing and processing, marketing, and hospitality- are in production. In Namibia, Tanzania, Uganda, and Zambia as much as 90 percent of employment in the agrifood sector is in agricultural production (Malabo Montpellier Panel 2021a). However, the income earned from such employment often is constrained by poor production practices. In Ethiopia, for example, youth-headed households are less likely than other farming households to use improved technologies, like inorganic fertilizer and improved seed, and less likely to receive and use advice from extension officers (Tranchant, et al. 2019). Young farmers in Malawi were found to use fewer modern inputs than do older farmers (Aurino, et al. 2019). As a result, agricultural productivityespecially for youth-headed farming householdsremains below potential. These continuing low yields perpetuate the perception among youth that on-farm labor is hard and unprofitable work.

The rapidly emerging new technologies and tools in the Fourth Industrial Revolution–a digital revolution characterized by the fusion of technologies (Schwab 2016)–bear significant potential across all segments of agrifood systems. The new possibilities they bring require that governments design strategies and pathways that make use of them to generate employment opportunities. This, in turn, requires improved access of young people to inputs, new technologies, and the training and knowledge they need to play an active role in production and in the other segments of agrifood systems (Malabo Montpellier Panel 2018). Over the last six years, the Malabo Montpellier Panel has identified several policy and technological solutions that can help ease the challenges that young people and, in particular, young women, face in accessing machinery and equipment and in harnessing the benefits of digital solutions to produce food, including livestock products (Malabo Montpellier Panel 2018). For example, a simple upgrade from bucket irrigation to treadle or pedal pumps, combined with microfinance products or the application of digital agriculture tools, can significantly reduce the amount of time and labor that is devoted to irrigation, allowing diversification of crops and increasing productivity. Similarly, the use of modern mechanized tools and technologies enables automated plowing, thereby removing the drudgery of on-farm work as well as freeing up time for other economic activities.

Efforts have been made by some African governments to promote mechanization by providing machinery at subsidized rates to farmers, establishing state-led mechanization hire schemes or tractor assembly plants, and facilitating private service providers through the provision of state-subsidized tractors. Such schemes include Agricultural Service Centers in Mozambique, Agricultural Equipment Hiring Enterprises in Nigeria, and Agricultural Mechanization Service Centers in Ghana (Daum and Birner 2020). The inclusion of youth in these agricultural mechanization programs can reduce their unemployment rates while increasing agricultural productivity.

Moreover, partnerships between the government and private sector can lead to increased ownership or hiring of machinery by young farmers through digital solutions. These digital services allow young people to circumvent challenges due to their low asset ownership and, hence, limited collateral by hiring tractors, instead of purchasing them. Among the most prominent examples of such an approach to enable the increased use of farm machinery by young farmers in Africa are Hello Tractor and TROTRO Tractor (Text Box 5.10).

Text Box 5.10. Hello Tractor and TROTRO Tractor–digital platforms to hire out agricultural machinery services

Hello Tractor is a digital solution developed and launched in 2014 by a young entrepreneur in Nigeria to increase and optimize tractor activity in Africa. Hello Tractor connects farmers to tractor owners in 13 African countries. An off-the-shelf monitoring device is fitted onto a tractor, allowing the owners to manage their machines using an app. Each monitoring device is equipped with a SIM card for data transmission. Hello Tractor gives smallholder farmers access to machinery that would otherwise be out of reach because of their high cost, allowing farmers to plant forty times faster at one-third the cost and carry produce to market quickly with reduced postharvest losses. Tractor owners also benefit from improved and coordinated access to farmers and a clear overview of the performance and condition of each machine (Bhalla 2021, Foote 2018).

In 2018, Hello Tractor partnered with the Nigerian Agricultural Mechanization & Equipment Leasing Company of the Federal Ministry of Agriculture and Rural Development of Nigeria to supply 10,000 tractors over five years. The government leases the tractors to new owners on a pay-as-you-go model, eventually reselling them to the owners at a discounted price. In support, Hello Tractor provides a telematics solution for monitoring, security, and valuation of the tractors, as well as allowing the tractor owners to maintain connectivity and to schedule services for the tractors. It is expected that these tractors will bring 9 million ha. of land into production, producing 37 million metric tons of additional food and more than 2 million direct and indirect jobs (Foote 2018, Hello Tractor 2022).

Similarly, TROTRO Tractor hires out machinery and shares farming services through a digital platform and mobile phone services in Benin, Ghana, Nigeria, Togo, Zambia, and Zimbabwe. It matches small-scale producers with the agricultural machinery they require, primarily tractors, and with the owners of that machinery, through a digital platform accessed via smartphone apps, as well as through Unstructured Supplementary Service Data (USSD) for users who do not own a smartphone. As with Hello Tractor, this platform allows tractor owners to monitor the movement and work progress of their equipment (FAO 2022a, Trotro Tractor 2020). Funding received from the Alliance for a Green Revolution in Africa helped to onboard 50,000 Ghanaian farmers in a project called Financial Inclusion for Smallholder Agriculture Productivity, in partnership with an agricultural equipment services company Agro Africa Ghana. As of 2022, TROTRO Tractor had a total of 75,000 farmers registered. It relies on both business-to-client and business-to-business relationships, retaining a commission on the cost of the service. TROTRO Tractor plans to partner with other African governments to improve food production through mechanized farming. The company will focus on East Africa and Francophone countries in West Africa in the next few years (FAO 2022a, Ihua-Maduenyi 2022).

Several other digital solutions, including those that facilitate saving for purchasing inputs, provide accurate weather forecasts, disseminate data on pest infestations, or offer access to veterinary and extension services, such as DigiFarm (Text Box 5.11), help to raise the productivity of young food producers. A study in Uganda has shown that mobile phone users have higher coffee yields, farm incomes, and off-farm incomes than nonusers as a result of both their improved access to better production technologies and higher input use intensity (Malabo Montpellier Panel 2019). In areas with limited access to the internet and smartphones, particularly in rural areas, mobile applications that also use Unstructured Supplementary Service Data (USSD) can enable smallholder farmers who have a mobile phone, but not a smartphone, to use and benefit from these digital agricultural services.

Text Box 5.11. DigiFarm-digital services for smallholder farmers

DigiFarm is an integrated mobile-based platform for digital services tailored for smallholder farmers that was launched in 2017 by Safaricom, Kenya's largest telecommunications provider, with support from the AgriFin Accelerate program of Mercy Corps. DigiFarm is a free mobile platform that provides farmers with convenient, one-stop access to quality farm inputs at discounted prices. It also provides access to input loans, learning content on farming, and access to output markets. The inputs provided by DigiFarm include mineral supplements (livestock and dairy), feeds, fertilizer, agrochemicals, seed, and veterinary products. The repayment of input loans is fully due at the end of the crop season for which the loan was taken but the farmer is allowed and encouraged to pay bit by bit throughout the specific season. Other value-added services provided include insurance yield cover and extension services through remote agronomists located at the DigiFarm call center or on-ground DigiFarm Village Advisors (Mercy Corps 2019, Safaricom 2023).

By 2019, DigiFarm had over one million farmers registered, with 43 percent of them being women. More than 50,000 farmers had purchased inputs through DigiFarm's input platform. Additionally, approximately 60,000 digital input loans have been approved on the platform, with nearly 90 percent repayment rates. About 310,000 farmers have accessed DigiFarm learning content through platform learning partners, such as Arifu and iCow (Mercy Corps 2019).



Special feature: New agricultural production technologies for youth to exploit

Most farms in Africa have yet to mechanize their production activities. This presents an opportunity to build future strategies on new and emerging technologies that can make the workplace-on and off the farm-safer and more productive while creating employment for the next generation across the value chain. Agricultural mechanization can be augmented by emerging technologies, such as drone technologies, robotics, artificial intelligence, deep learning, machine learning, the internet of things, embedded systems and software, intelligent sensors, Big Data, and autonomous agricultural and farming equipment. Just as biological innovations and plant breeding are altering the map of production possibilities profitability, digital technologies and will have considerable implications for the future competitiveness of African farmers in global and regional markets.

For example, by automating tractor steering, farmers of field crops in Africa stand to gain benefits that include, but are not limited to:

-Reduced operator fatigue and operator experience requirements;

-Reduced labor costs, as sourcing of seasonal skilled labor is increasingly becoming a challenge for many primary producers;

-Reduced risk of equipment damage;

-Reduced machinery overlap error, resulting in reduced input costs for seed, fertilizer, and pesticides, and

-Adoption of controlled-traffic farming practices, which have delivered reduced soil compaction, nutrient loss, and soil erosion and increased soil health.

GPS guidance has allowed operators with minimal experience to efficiently operate complex equipment. Although they are a long way from being deployed at scale on African farms, GPSguided tractors and planters accurately position and automate farm machinery operations. These emerging intelligent machines and smart agricultural equipment that are embedded with sensors and technologies will improve, simplify, and accelerate agricultural production performance. They will also gather continuously and in real-time complex data that will facilitate improvements in productivity, predictability, and risk-minimization in farm production, resulting in new opportunities and efficiencies along agrifood value chains. Another emerging area is machine telemetry and connectivity for remote farming support. Combining telematics with onboard modems allows remote support, monitoring, and control of farm machinery. Controller software updates can be performed, commands sent, and work orders received remotely, as long as the machines are within a mobile network (Malabo Montpellier Panel 2018).

As an increasing volume of data is being both uploaded to and downloaded from farm machinery, robust mobile networks and high internet speeds are essential. While the above technologies may still be out of reach for the large majority of African farmers, now is the time for governments to invest in creating the policy, regulatory, and institutional conditions as well as partnerships with the private sector to harness and encourage their use for the benefit of African small farms (Malabo Montpellier Panel 2019). Advances in robotics and its application to agriculture are happening fast around the world, and the share of farmers that can already benefit from digital technologies in African agriculture is also growing fast, taking into account that farms ranging from 10 to 20 hectares represent the fastest growing farm segment in some countries in Africa and already account for more than 5 percent of the farm area in several countries. In addition, IT applications are already being used to facilitate the sharing of agricultural machinery (Text Box 5.10). Such services are using mobile technologies to link machine owners to farmers who need agricultural mechanization services on their farm and help the owners keep track of their equipment.

In crop production, precision farming involves new production and management techniques that make intensive use of data about a specific location and crop. Sensor technologies and application methods are used to optimize agriculture production processes and growth conditions, which increases resource and cost efficiency and reduces the environmental impact of agriculture. For example, crop sensors can help farmers apply fertilizer effectively while maximizing nutrient uptake by the crop. The sensors inform the application equipment how much fertilizer to apply in real time depending on the state of the crop, based on the amount of light reflected back to the sensor. More efficient fertilizer application to meet actual crop needs prevents fertilizer leaching and runoff into groundwater (Rehman, et al. 2016). Through such smart farming techniques and ICT, particularly mobile telephone technology, farmers can monitor and control irrigation systems without traveling to their farms. Communication from moisture sensors in the irrigated field reports the level of moisture present in the soil at any depth. This information is used to determine the precise amount of water, as well as other agricultural inputs like fertilizers, to be applied by irrigation (Rehman, et al. 2016).

In animal production, Precision Livestock Farming involves the use of sensors for monitoring and early detection of reproduction events and health disorders in animals. Data on the animals, such as pulse rates, body temperature, animal activity, tissue resistivity, and GPS position, are monitored. SMS alerts can be sent to the farmer based on predefined events, for example, when a cow is ready for reproduction (Poonia, et al. 2019).

Young people often lack access to formal financial institutions. They usually have limited collateral, such as assets, which generally is required to obtain a loan. In consequence, most are limited in their ability to purchase improved agriculture inputs. Additionally, agriculture as a sector continues to be regarded as risky for banks to lend to. Weather problems or pests and diseases increase the risks of obtaining a poor harvest through rainfed cropping. Smallholder farmers are often considered too risky for loans and investments–it is difficult to determine farmers' creditworthiness if they do not regularly use the services of financial institutions. This further perpetuates the perceived Precision Livestock Farming systems also can help optimize the use of feed by monitoring feed intake in individual animals and adjusting their feed rations as necessary, based on the activity levels and energy consumption of the animal as determined through sensors. This helps to reduce feed waste by optimizing feed usage. Such systems have been applied to poultry, swine, dairy cattle, and beef cattle (NutriNews 2023).

Traditional agriculture production systems in Africa and the value chains they supply will continue to experience disruptions due to changes in technology, as has been seen in other industries. How African countries position themselves to harness and deploy digital technologies will determine the future competitiveness of African agriculture and its contribution to African economies. Now is the time to devise appropriate strategies to equip the next generation of farmers.

risk of lending to young people in the agrifood sector (Malabo Montpellier Panel 2019). Digital solutions can enable greater financial inclusion of farmers in rural Africa. For example, young farmers' credit profiles can be built by recording farm performance data, including productivity, expenses, and revenues. This data can then be combined and utilized by lending institutions using technologies such as machine learning to make reliable lending decisions. For instance, FarmDrive in Kenya collects and aggregates data from multiple sources to build credit scores for farmers so that they can access loans and other financial services (Text Box 5.12).

smallholder farmers FarmDrive uses mobile phones, alternative data, and machine learning to close the c

Text Box 5.12. FarmDrive-an alternative credit-risk assessment model to assist

FarmDrive uses mobile phones, alternative data, and machine learning to close the critical data gap that prevents financial institutions from lending to creditworthy smallholder farmers. Based on a farm's data–productivity levels and financial accounts–together with satellite, agronomic, and local economic data, FarmDrive prepares reports to analyze the creditworthiness and solvency of potential beneficiary farmers. FarmDrive's alternative credit-risk assessment model provides financial institutions with an agriculturally relevant and data-driven model to assess risk and to develop loans that fit the needs of smallholder farmers. Once approved, the loans can be received via mobile money. FarmDrive additionally bundles loans with hybrid index insurance and supports financial institutions to create loan products that are more likely to be repaid on time and protected in the event of unforeseen adverse shocks to production. Between 2014 and 2018, FarmDrive distributed over USD 300,000 in loans to Kenyan farmers, 37 percent of whom were youth (Malabo Montpellier Panel 2019, Mercy Corps 2018).

Mobile money solutions also allow young people to save, obtain loans, and make or receive payments, contributing to increased agriculture productivity. A study in Uganda found that mobile

money adoption increased per capita farm income by 13 percent due to the increased likelihood of the farmer using fertilizer and improved crop varieties (Tabetando, Matsumoto and Fani 2022).

Mobile money solutions are also upgrading the operations of informal savings and credit groups. In Kenya, the Grameen Foundation and Musoni Kenya, a local microfinance institution, introduced Kilimo Booster, a loan product offered through a mobile money technology app. Between 2013 and 2017, Kilimo Booster disbursed over 17,000 loans (Nyawira 2017). In Mozambique, the rising use of mobile money savings is found to be associated with greater capital investments (Batista and Vicente 2020), while in Niger, mobile money cash transfers during a drought led households to diversify the crops they grew (Aker, et al. 2016). In Tanzania, mobile money usage is associated with an increase in maize productivity by about 124 kg/acre and a nearly 25 percentage point reduction in the likelihood of a household having a consumption level below the poverty line (Kilombele, et al. 2023).

Within the context of climate change and the need to preserve the natural resource base on which agrifood systems depend, it is essential to promote sustainable agricultural practices that incentivize youth-led initiatives in conservation and climate-smart agriculture. By incorporating environmental considerations into policy frameworks, governments can encourage young farmers to adopt sustainable practices that protect natural resources, enhance resilience to climate change, and contribute to the overall well-being of communities. New digital technologies can help make farming more sustainable and productive while creating new employment opportunities for youth. Digital agriculture-the application of digital tools along agricultural value chains-empowers young farmers with knowledge, enables the optimization of agricultural productivity, and enhances their access to upstream and downstream markets (Daum, Adegbola, et al. 2022). Furthermore, the adoption of digital agriculture technologies, such as digital irrigation technologies, can help increase agricultural productivity amidst climate change through the targeted use of inputs, such as seed, fertilizer, and water (African Union 2022).

To empower youth employment in agrifood systems, Mali passed laws to allow increased access to agricultural land by youth and also developed programs to support youth in irrigating their land (Text Box 5.13). Some governments in Africa have also partnered with the private sector to promote the development of innovative irrigation technologies and support their adoption at scale, for example, the Tele-Irrigation kit in Niger (Text Box 5.14). Inclusion of youth in such initiatives can increase their access to and adoption of digital agriculture technologies for expanded employment opportunities.

Text Box 5.13. Mali's Youth Inclusion and Empowerment in Agrifood Systems Employment

Through the Agricultural Orientation Law and the Mali Agricultural Development Policy, the Government of Mali emphasizes equal access to productive resources through the allocation of agricultural land to youth and other vulnerable groups, including women. In addition, Article 13 of the Agricultural Land Law stipulates that "at least 15 percent of land development by the state or local authorities is allocated to groups and associations of women and young people established in the area concerned". Pay-as-youown financing schemes have encouraged youth involvement in irrigated farming as well as secure and equitable land access. These have been implemented through the National Program for Small-Scale Irrigation and the Office du Niger irrigation scheme. Ten percent of developed irrigated land is allocated to youth and women through these agencies.

Youth are also trained, monitored, and supported in the use of agricultural machinery for cultivating various crops, such as through, for example, the Project for Food Security Consolidation through Development of Irrigation Farming. Participants receive help in accessing finance and in developing business plans. Youth are prioritized in accessing irrigation schemes and market gardens and are provided with financial and technical support for their small- and medium-sized processing enterprises. The government also supports youth in the processing and marketing of their products through the construction of processing facilities (IMWI 2023).

Text Box 5.14. The Tele-Irrigation Kit for efficient irrigation of crops in Niger

The Tele-Irrigation Kit was developed in 2011 in Niger. It contains a solar station and pump, a water distribution network, and a mobile phone. Tele-Irrigation collects remotely and disseminates in real-time meteorological and hydrological data, such as temperature, soil moisture content, rainfall, solar radiation, and wind speed. Analysis of this data enables farmers to remotely control their irrigation systems using a mobile phone. Famers are therefore able to save time, use water more efficiently, and possibly increase their land under irrigation, which can increase their production and their income. With the help of funds from the Agricultural Productivity Program in West Africa, Tele-Irrigation kits have also been adopted for use in the production of fodder in breeding centers to compensate for the lack of fodder during the dry season (Malabo Montpellier Panel 2019).

The reduced drudgery at the production level that is realized through the adoption and use of new digital technologies, as described above, can play a crucial role in attracting youth to the agrifood sector and motivate them to seek agribusiness employment opportunities, including at the production level. The less time and labor required for production tasks on the farm frees up the time of young farmers, which can be used for other economic activities. However, access to affordable and reliable ICT devices, such as smartphones, coupled with increased connectivity is necessary for youth in Africa to take advantage of the opportunities for the adoption of digital technologies in agriculture.

Improved ICT access also can support networking among youth, thus reducing their physical isolation in remote areas and facilitating their access to information through mobile agricultural extension services and also connect them to agribusiness and employment services (MINAGRI, FAO, and AU 2018). Senegal, for example, has increased the access of poor and rural populations to ICT services as a means of contributing to their development. Senegal's government has also developed digital agriculture solutions as a means of increasing agriculture productivity and increasing employment opportunities for youth. DARAL Technologies is one of these (Text Box 5.15). In Côte d'Ivoire, the use of digital technologies and services in the agriculture sector has been facilitated by legislation ensuring universal access to ICTs and a favorable fiscal regime with a zero percent customs duty and exoneration of VAT on ICT equipment. The government also has formulated an e-agriculture strategy and facilitated the creation of digital financial services (Malabo Montpellier Panel 2019).

Text Box 5.15. Senegal's Universal Telecommunication Service Development Fund (FDSUT) and DARAL Technologies

In 2007, Senegal created the Fonds de Développement du Service Universel des Télécommunications (FDSUT–Universal Telecommunications Service Development Fund) to provide financial support to any public agency for the provision of ICT services and extension of telephone and internet services to underserved areas. It also promotes the participation of the private sector in the provision of telecommunication services in rural areas. FDSUT also provides funding for the development of innovative ICT solutions for the agriculture sector, such as DARAL Technologies (FDSUT 2023).

DARAL Technologies was established in 2014 by young entrepreneurs to support farmers dealing with livestock diseases and cattle rustling. Both web and SMS platforms are connected with a common centralized database. Traceable nose rings on livestock are used to track, monitor, and communicate about herd movement through SMS alerts. The mobile platform gives breeders the ability to interact with vets and agents from their locality in case of rustling or epidemiological risks (DO4Africa 2019). The technology is also used by individuals or organizations that are looking to buy or sell livestock through secure transactions. By 2016, DARAL had been active in 10 villages in southern Senegal, directly serving over 2,500 farmers.

DARAL is to be brought to scale in collaboration with the Ministry of Agriculture. The government's Digital Senegal 2025 Strategy seeks to improve productivity through easier access to information on prices, soil quality, weather, and new farming techniques via mobile phone and the internet. To do so, the government is implementing a system to modernize agricultural activities by developing mobile telephone, GIS, and satellite imagery-based applications to allow forecasting throughout the production cycle, send shock alerts, raise awareness on prevention measures, and provide the geolocation of livestock (Rahman and Fong 2016).

Young men and women are already participating in Africa's food systems, helping to raise farm productivity and to start businesses at all stages of agrifood value chains. However, their continued inclusion is not assured without supportive policies and public investment programs (Mueller, Rosenbach and Thurlow 2020). Youth must be actively involved in the design, development, and scaling up of mechanization and other new agricultural technologies, including digital solutions. Strategies for land tenure, mechanization, irrigation, digitalization, energy solutions, and finance that take into account the specific needs of young people are all urgently needed across African countries. Implementing these strategies will require, in turn, close coordination between youth, technical experts, and the respective line ministries responsible.

5.3 Processing and value addition

SDG 2 aims at achieving a world free of hunger by 2030. However, in 2022, it was estimated that approximately 735 million people suffered from chronic hunger globally and about 2.4 billion people were moderately to severely food insecure (United Nations 2023a). The high prevalence of hunger is worsened by increasing amounts of food losses worldwide. Approximately 30 percent of food produced for human consumption is wasted or otherwise lost globally, amounting to about 1.3 billion tons annually and worth approximately USD 1.0 trillion (WFP 2020). In sub-Saharan Africa, food loss is about 100 million tons annually (African Union 2018b).

Food lost immediately after harvest in Africa has been estimated to be between 30 and 40 percent of what African farmers produce (AUDA-NEPAD 2021b). Post-harvest management includes a combination of approaches across the agrifood value chain that together contribute to reduced levels of losses occurring during harvest and afterward for all food crops, livestock, and fisheries products (African Union 2018b). In addition, the processing of crops and livestock-derived produce can significantly increase incomes with important multiplier effects, as discussed earlier. The numerous processes involved during harvest and in postharvest management, such as cleaning, storage, processing, grading, packaging, transportation, and marketing, also contribute to improved food security and can provide important and profitable employment opportunities for the youth.

5.3.1 Harvest and post-harvest handling

At harvest–Food losses at harvest can result from damage due to improper harvesting methods, such as poor or rough handling and a lack of appropriate harvesting tools, equipment, and containers (Kiaya 2014). Most harvest work is manual. Adoption of improved automated harvest technologies would not only reduce losses at harvest, but also increase youth interest in agriculture for income generation, given the reduction in drudgery.

In this context, a study conducted in Nigeria revealed that rice farmers perceived harvesting and threshing as great business opportunities for youth-approximately 90 percent of the farmers were willing to upgrade from traditional methods to the use of a mini-harvester or a reaper and were willing to pay for postharvest services to use that equipment (Fiamohe and Agossadou 2019). The study further showed that access to credit, extension services, and training to build knowledge on issues related to post-harvest losses would increase farmers' willingness to upgrade and pay for services involving improved harvesting equipment. Youth in Africa can tap into this opportunity to create employment by establishing businesses that rent or lease improved harvesting technology to smallholder farmers. Thus, policies are needed to provide an enabling environment that supports youth in acquiring this modern postharvest equipment and in building their capacity to profitably use it within a business context.

Post-harvest losses due to untimely harvesting arise from the fear that mature or ripe fruits and vegetables will be easily damaged and have shorter shelf-life, causing some farmers to harvest those crops earlier than the start of the optimal harvest period. Doing so, however, can impact the nutritional and economic value of crops. Moreover, consumers may fail to purchase them due to their unsuitability for consumption (Elik, et al. 2019). Upon harvest of mature fruits, most smallscale farmers tend to use traditional methods to increase the shelf-life of the crops before storing or transporting them. These methods include sundrying fruits and vegetables on the ground, which can expose the food to contaminants. Initiatives that increase young people's access to affordable energy-efficient technologies for drying products that will ensure food safety, nutritional quality, and the preservation of produce after harvest can increase profits-for instance, solar dryers for fruits and vegetables.

Storage–Although losses can occur at each stage of the agrifood supply chain from production to consumer level, storage losses are considered one of the most critical in adversely affecting the availability of food in developing countries. Storage involves maintaining the quality of agricultural produce to prevent deterioration for a given period. Most small-scale producers in Africa, especially in rural communities, cannot afford to purchase improved storage technologies or vehicles to transport their produce after harvest to prevent postharvest loss due to spoilage or pests.

A study in Tanzania showed that farmers who acquired loans to be paid with interest stored 29 percent more and sold 50 percent more maize in the lean season on average, than did farmers who had received a storage intervention alone without any loan (Channa, et al. 2022). The loans coupled with the improved storage technologies allowed farmers to increase their maize sales throughout the year. These results suggest that youth can create and find employment opportunities through the creation of warehouses and other crop storage businesses, enabling them to employ their peers and charge fees to smallholder farmers to store their produce, in addition to providing other extension services. For instance, Agroways in Uganda has partnered with 25,000 smallholder farmers and producers to provide storage space in their warehouses that are certified for grain handling and storage (Agroways 2023). Due to their wide distribution, Agroways warehouses are easily accessible, saving farmers on transportation costs too.

Text Box 5.16. Sesi Technologies

Sesi Technologies was founded in 2018 by a young engineer, Isaac Sesi, who commercialized the results of his research at Kwame Nkrumah University of Science and Technology to redesign a moisture meter to be locally adapted for Ghana-the GrainMate moisture meter. With the instrument, farmers, traders, warehouse operators, and feed producers are able to instantly measure the moisture content of grain at harvest and during post-harvest stages during storage and processing. The company further developed the GrainMate App to pair with the GrainMate moisture meter. The app enables users to record the moisture content of their grain and obtain instant recommendations of buyers seeking grain at that moisture level, increasing their grain sales (Sesi Technologies 2021).

Sesi Technologies has developed several other solutions for preventing postharvest losses. These include:

- GrainMate Warehouse Monitor-monitors the temperature and humidity in warehouses, providing this information to users in real-time through a mobile app. Users are alerted if the stored grain is at risk of getting moldy.
- AgroMarket-a digital marketplace in which anyone can buy and sell agricultural products in Ghana. By facilitating timely access to markets, users can reduce postharvest losses by selling when market prices are most profitable for them.
- ZeroFly Hermetic Storage Bag–protects grains and other dry agricultural commodities from mold and insect infestation for up to two years.

Sesi Technologies also offers small-scale farmers a FarmerPack consisting of the GrainMate moisture meter, ZeroFly hermetic bag, grain drying services, grain threshing services, warehousing services, market access via the AgroMarket app, and post-harvest management training. The company offers flexible payment options, which allow farmers to exchange grain for FarmerPack solutions and services.

By 2021, over 2,000 farmers had benefitted from the services and tools offered by Sesi Technologies. This included more than 1,500 smallholder farmers trained in post-harvest management, 37 farmer-based organizations reached, over 600 GrainMate moisture meters in use and over 300 mt of grain protected with ZeroFly hermetic bags.

Sesi Technologies has been successfully providing such post-harvest management services to farmers in Ghana (Text Box 5.16). These services result in higher profits when the farmer's produce is sold. Better storage enables farmers to avoid having to sell their produce immediately after harvest when prices are much lower than later in the year and farmers lack bargaining power. Reducing current high post-harvest loss rates during storage in Africa requires increased youth capacity building to develop affordable improved technologies suitable for the local context, as is evident from the example of Sesi Technologies. Additionally, young farmers need to acquire training in improved technologies and strategies to reduce post-harvest losses. Trained farmers can then provide extension services to their fellow smallholder farmers and earn some income by doing so.

Another way in which young farmers can be supported to store their crops to obtain greater profits from them is through enabling youth to access digital financial solutions to obtain loans to help them solve their storage challenges. An example of financial support to facilitate storage is the program of maize home-storage loans provided to Kenyan farmers by the agricultural development organization, One Acre Fund (2015).

Training in improved postharvest handling can be provided through public-private partnerships. This is how Sasakawa Africa Association has partnered with national agricultural extension services in Ethiopia, Mali, Nigeria, and Uganda, training smallholder farmers in how best to prevent postharvest losses along the agricultural value chain using improved technologies (Sasakawa Africa Association 2023) (Text Box 5.17).

Text Box 5.17. Sasakawa Africa Association-improved postharvest handling and agro-processing

Sasakawa Africa Association (SAA) conducts training of trainers, who primarily are the extension staff of the Ministry of Agriculture in the African countries in which SAA works. Field demonstrations and capacity building of trainers, farmers, and entrepreneurs help to increase knowledge of improved and profitable post-harvest crop management methods in farming communities. SAA specifically targets youth groups in rural areas so that they perceive the potential of agriculture as a business.

SAA also works to improve postharvest handling and agro-processing by smallholder farmers by promoting private service providers to supply value-adding mechanized services to farmers. For example, SAA introduced mechanized teff threshing in Ethiopia, which takes a fraction of the time required with traditional methods. The method is cleaner, producing grain that is less damaged, and it is also cheaper than motorized threshing. This small private rural business model can be applied to maize shelling, rice threshing and milling, and flour milling, so is now being promoted in other countries as a profitable postharvest technology that private enterprises might adopt.

In 2010, SAA established the Post-harvest Extension and Learning Platforms (PHELP), which are equipped with appropriate technology packages to demonstrate the use, maintenance, and management of the technologies. Young farmers can take a basic management course under PHELP to start a postharvest handling and agro-processing business enterprise (Sasakawa Africa Association 2023).

5.3.2 Processing and value-addition

2022, employment in agro-processing In activities accounted for only around 5 percent of total employment in the food economies of Ghana, Tunisia, and Ethiopia. However, the agroprocessing sector exhibits high employment elasticities of output in these countries-at 0.55 in Ghana, 0.66 in Tunisia, and 0.85 in Ethiopia (Kubik, Getahun, et al. 2022). This indicates that the agroprocessing sector is labor-intensive and presents high employment generation potential, both in absolute terms and compared to other sectors of manufacturing. Additionally, the different stages food undergoes during processing to add value require different expertise and skill sets to manage, thus creating new and additional employment opportunities that youth can tap into. The growing demand for processed food, in particular, presents an important opportunity for youth in African countries to support the development of a competitive food-processing sector, driving demand for the produce of smallholder farmers, creating formal jobs and increasing incomes, and increasing the availability of affordable, safe, and nutritious food (Malabo Montpellier Panel 2020).

Primary processing–Primary processing involves cutting, cleaning, hulling, sorting, pasteurizing, milling, grinding, packaging, storing, and refrigerating raw foods to prevent spoilage and to ensure food safety before consumption (FutureLearn 2022, Kiaya 2014). Minimally processed foods usually retain most of their nutrients if these operations are done manually. However, these processes are very labor-intensive, while improved processing technologies, such as combine harvesters for threshing, are very expensive. Increasing access to improved machinery and tools for primary processing and expanding capacity development efforts among youth to innovate cheap and affordable technologies would increase their employment opportunities. For example, AfricaRice has built capacity and provided employment opportunities for youth through developing thresher technologies in Nigeria (Text Box 5.18). Machine prototypes can also be identified and adjusted to better meet local needs, such as the prototype thresher from Asia that was adapted to meet local needs in Senegal through a public-private partnership with the International Rice Research Institute (Text Box 5.19).

Text Box 5.18. AfricaRice's Youth Empowerment

AfricaRice, a CGIAR research center headquartered in Côte d'Ivoire, in partnership with the Support to Agricultural Research for Development of Strategic Crops in Africa and the Technologies for African Agricultural Transformation projects, has established innovation platforms and disseminated technologies and innovations in rice hubs across Africa. These have contributed to job creation for youth and strengthened relationships between actors along the rice value chain.

In Nigeria, for example, youth have been trained in the use of a thresher developed by AfricaRice. Those who received training were given threshers to provide threshing services to farmers. Over 500 threshers were manufactured by small and medium enterprises involving youth and were sold in the beneficiary countries (AfricaRice 2019). By 2020, AfricaRice also had built the capacity of over 460 youths (45 percent female) in parboiling technology, packaging and branding of locally produced rice, farm mechanization tools, business plan development, and rice thresher operations, as well as in the use of RiceAdvice, a smartphone app that assists youth in providing services to other rice hub actors for a fee (Text Box 6.5) (AfricaRice 2020a).

Text Box 5.19. Adaptation of Asian rice thresher-cleaner by the International Rice Research Institute, AfricaRIce, and their Senegalese partners

The International Rice Research Institute (IRRI) and AfricaRice worked in partnership with the Senegalese Institute of Agricultural Research, the Senegal River Valley National Development Agency, local manufacturers, and end-users to adapt a prototype Asian rice thresher-cleaner to local needs (Mohapatra 2012). The adapted thresher-cleaner was locally constructed, affordable, and appropriate for local smallholders' needs. Whereas manual threshing yields one ton of paddy per day, the thresher-cleaner produces six tons of paddy, with a grain-straw separation rate of 99 percent and no need for additional sifting and winnowing. The price for one thresher-cleaner is approximately USD 5,000, with a lifetime of five years. The thresher-cleaner has since become the most widely adopted machine in Senegal's rice sector, with more than 50 percent of the total paddy produced in the country threshed with this thresher-cleaner.

Secondary processing–Secondary food processing involves the conversion of raw food ingredients into more useful or edible products that are refined, purified, extracted, or transformed from minimally processed primary food products. Examples include processed dairy products, flours, and edible oils. Secondary food processing includes both physical processes, such as pressing, milling, and dehydration, and (bio)chemical processes, such as hydrolysis, hydrogenation, or using enzymes (FutureLearn 2022).

The adoption of improved processing technologies can result in important multiplier effects both within and beyond the agriculture value chain concerned. For instance, the rise of millet processing due to the use of modern equipment facilitated in Senegal the preparation of millet-based products in rural areas and also resulted in their increased consumption in urban areas due to increased demand (Faye and Gueye 2010). This expansion in demand opens up new markets for smallholder farmers and boosts their incomes. Equally important, it creates business opportunities for youth in food transportation and distribution to move the processed foods from processors to consumers as well as new growth in other sectors of agrifood systems, such as hospitality, restaurants, and food services. In addition to reducing post-harvest losses by adding value to food, secondary food processing can contribute to improved nutrition for consumers through increasing diversity in diets, improving nutrient bioavailability, or by nutrient fortification of food items to combat micronutrient deficiencies in vulnerable groups. By investing in agro-processing capacity for indigenous crops, such as millets, fonio, and teff, which are highly nutritious, the food processing sector can help meet demand in urban centers while also helping in the combat against malnutrition. Since the processing methods, preparation conditions, and other ingredients added to a product may affect nutrient content and bioavailability, food industries need properly trained personnel. For example, nutritionists,

food technologists, engineers, and ICT experts can jointly innovate locally adapted processing techniques, machinery, and tools needed to costefficiently manufacture nutritious products, such as threshers (Text Box 5.18 and Text Box 5.19) and other agricultural machinery. Succeeding at such efforts will also reduce the drudgery of farm operations. In rural areas with limited access to electricity, young farmers can be taught how to process perishable crops, such as fruits and vegetables, to reduce postharvest losses for increased income. An initiative supporting farmers in several countries in this way is the YieldWise program, which is focused on the tomato value chain (TechnoServe 2021) (Text Box 5.20).

Text Box 5.20. YieldWise Program to reduce postharvest losses and improve income from tomatoes

In 2016, TechnoServe established the YieldWise program to improve smallholder farmers' livelihoods and reduce postharvest losses in Kenya, Nigeria, and Tanzania, especially in the face of climate change. The program trains farmers in good agricultural production practices, how to use evaporative cooling chambers to keep perishable food fresh, and how to set up in-home food processing units. Tomatoes are sensitive to humid conditions, so most tomato farmers prefer to grow the crop during the dry season. This results in sharp seasonal spikes in local tomato supply and low prices. On the other hand, while the rainy season is not conducive to growing tomatoes; low supply at that time of year leads to high demand and high prices. Therefore, the cooling chambers can preserve fresh tomatoes, while in-home processing allows farmers to turn their fresh tomatoes into a paste or dried forms, which extends the shelf life and increases the market value of their crop. Farmers who processed their tomatoes were able to gain aggregate additional income of \$1.4 million from tomatoes that would have been wasted if not processed (TechnoServe 2021).

Most of the processed products on the market in African countries target children and their mothers. However, good nutrition is also critical for youth since adolescence presents a 'second window of opportunity' that may help compensate for the effects of poor nutrition during early childhood (Save the Children 2015). Additionally, the growth of African cities and the rising middle class has resulted in increased demand for processed or semi-processed foods. In many cases, this has led to a rise in obesity and other diet-related illnesses. Therefore, youth can exploit new opportunities in agro-processing by supplying more nutritious processed foods to serve the growing urban middle class. Young people with nutrition or food science education can develop affordable food products that match nutritional demands as well as the transforming tastes and preferences due to urbanization using locally available foods. In supplying such food products, the youth will simultaneously boost the income of the smallholder farmers producing the farm products that are processed into these food products.

Affordable food products targeting the youth market also can lead to increased profits for food industries, given the high number of youths in Africa, while also creating more jobs due to growing demand. Increased consumption of nutritious processed foods by youth also will contribute to their improved nutritional status, which can have good long-term health effects, such as a reduction in underweight newborns born to healthy young mothers. More healthy adults contribute to the required human resources for economic development, which also reduces costs and burdens on the healthcare systems over time.

A major impediment to the growth and productivity of agro-processing enterprises operated by youth is a lack of the necessary skills to profitably manage them. Vocational training can support start-up small and medium-scale enterprises to grow, and enable managers to improve process and product innovation to boost productivity. This could be done, for example, through the use of renewable biological resources, such as biological waste and agro-processing residues, as the basis for bioeconomy development (Text Box 5.21).

Text Box 5.21. Career opportunities for youth associated with bioeconomy development

A bioeconomy offers an opportunity for African countries to leverage advances in science and technology to add value to abundant natural resources to create job opportunities for the youth in bio-based industries (Virgin, et al. 2022). With an average of 11 million young people joining the African labor market and only 3.7 million jobs being created annually, the transition to a bioeconomy can play an important role in addressing Africa's employment gap. As a transition to a bio-based economy will stimulate greater agroprocessing, Africa's young jobseekers will have more opportunities to access well-paid and stable jobs. This can lead to an increase in agro-industrial and other value-added products with potential applications in many sectors, including pharmaceuticals, green chemicals, industrial materials, and energy.

The Malabo Montpellier Panel (2022a) drew attention to fields of innovations that are rapidly evolving worldwide and in which Africa is well-positioned create unique approaches. Doing so has the potential to turn around its agrifood systems and increase related employment opportunities. Key issues hindering the growth of the bioeconomy on the African continent–which if addressed could unlock significant employment opportunities for young people–include a lack of dedicated policy and legal frameworks to promote a bioeconomy, challenges to research and development in bio-based industries, skills development training, financing, and infrastructure. As countries across the continent advance on their bioeconomy agendas, there are tremendous opportunities to tap into emerging job opportunities.

In Kenya, the rising cost of livestock feeds and increasing demand for alternative sources of protein for both human and animal consumption has been a boon for creative youth to venture into insect farming (IDRC 2021). The International Centre of Insect Physiology and Ecology (*icipe*) and the Africa Center of Excellence in Sustainable Use of Insects as Food and Feeds have pioneered research and disseminated technology on insect farming (icipe 2019a, INSEFOODS 2021). Specifically, *icipe* trained 2,000 black soldier fly farmers and entrepreneurs in Kenya, including InsectiPro (icipe 2019b). InsectiPro, founded by a young entrepreneur in 2018, ventured into rearing black soldier flies by recycling organic waste (Solve 2020). InsectiPro can recycle 30 tons of organic waste per day to produce between 2.0 and 2.5 tons of black soldier fly larvae, which are then dried and turned into animal feed (How we made it in Africa 2023, Obulutsa 2020).

In Cameroon, the National School of Agro-industrial Sciences at the University of Ngaoundéré launched in 2023 an online master's degree in Bioresource and Process Valorization. Given the potential of science, technology, and innovation to create jobs through increased value addition to natural resources, the University aims to create a pool of researchers and professionals to create entrepreneurship opportunities in this emerging industry (AUF 2023). Training modules in the degree course include bio-waste processing, bio-refining, insect farming for food and feed, and entrepreneurship.

In South Africa, the Biomanufacturing Industry Development Centre (BIDC) program of the Council for Scientific and Industrial Research (CSIR) is an open innovation hub (Malabo Montpellier Panel 2022b). BIDC operates like an incubator for small and medium-scale enterprises and start-ups, providing biomanufacturing facilities, laboratory infrastructure, and access to experts in agro-processing and bioprocessing, as well as in product development and scale-up. Since its inception, BIDC has advanced over 100 bioproducts, including in nutrition, biotechnology, and cosmetics. The African Biomanufacturing Workforce Training Programme of CSIR works alongside BIDC to provide intensive and hands-on skills in bioprocess development to support and grow the biomanufacturing industry in Africa (CSIR 2023).

Storage and packaging–Lack of postharvest management skills and technology for value addition, storage and preservation, and packaging has caused economic and food security setbacks in Africa. Postharvest technologies, such as controlled ripening, edible coatings, chemical treatment methods, and temperature management–particularly temperature control to maintain the cold chain for milk, meat, fruits, and vegetables–are potential tools to reduce postharvest losses, increase food and nutritional security, and alleviate poverty (James and Zikankuba 2017).

Although most food crops are susceptible to spoilage due to poor temperature management during storage, fruits and vegetables are most affected since they are very perishable. Postharvest losses for fruits and vegetables are exacerbated by extreme weather events associated with climate change, particularly increased temperatures. Responding to this requires improved technologies for cool temperatures during storage. The inclusion of youth in initiatives that train farmers on affordable and improved storage, such as the YieldWise Program (Text Box 5.20), will enable them to increase the shelf-life of their produce and increase the income they generate from it, leading to more jobs in agrifood processing.

The limited shelf life of fruits and vegetables is also due to their susceptibility to rapid drying due to transpiration under normal atmospheric conditions, which causes them to wilt and shrivel. Therefore, adopting improved packaging technologies can protect food products and delay their physical, chemical, and biological deterioration. Better packaging will also ensure the availability of a greater variety of high-quality, nutritious, and affordable foods throughout the year, while increasing income for the producers and processors.

Health and safety regulation and compliance– Maintaining food safety and hygiene during the handling and processing of food products is especially important. When ensured, young agricultural entrepreneurs will be able to tap into larger regional and international markets for their products, such as the European Union. However, compliance with continental and global sanitary and phytosanitary measures requires skills and training. Consequently, increased attention to food safety can offer employment opportunities with government agencies or in the private sector.

Pesticide residues: Excessive usage of pesticides is associated with a lack of knowledge among farmers since most are unable to correctly interpret instructions on pesticide containers or bag labels (Ngabirano and Birungi 2020). Young people with education and training in agriculture can develop training manuals in local languages for commonly used pesticides to further educate farmers on the benefits of using correct quantities. Such training will also reduce health risks for those applying the pesticides and for consumers, while providing increased income for farmers due to the higher yields they realize. Youth can also develop digital solutions through which information is provided to farmers and processors on safe postharvest handling techniques, possibly through a fee-based system on mobile phones. Young scientists with biochemistry training are also needed for effective and efficient monitoring of pesticide usage across agrifood value chains to ensure safety for producers, processors, and consumers and to help more farmers meet the sanitary and phytosanitary requirements for cross-border trading of food products.

Young people with science, technology, engineering, and mathematics (STEM) training can also innovate digital technologies for quick

detection of pesticide residue to reduce the time taken in the quality control process along the agrifood value chain. Traditional methods, such as physical observation, are not effective, while laboratory tests, such as liquid chromatography, are time-consuming and expensive. Governments can also devise programs that increase access to funds for youth to acquire already developed advanced technologies for detecting pesticide residue concentrations by type to determine toxicity levels and the impact the residue may have on food quality. Embedding technology in produce screening processes is relatively simple and inexpensive and permits the processes to run at higher speed with an accuracy of 95 percent, even for detecting pesticide residues at very low concentrations (Thorat, et al. 2023). Youth can use the purchased improved technologies for contract work on behalf of the government to provide pesticide monitoring and regulation services at a fee.

Cleaning and sanitation: Prevention of food contamination at all stages of agrifood value chains is crucial to avoid food-borne outbreaks and postharvest loss due to spoilage. During the processing stage, different chemicals, including chlorine, ozone, hydrogen peroxide, trisodium phosphate, and organic acids, are used to remove or kill spoilage or pathogenic microorganisms on produce or on processing machinery and other equipment. However, the recommended chemical concentrations, amounts, and duration of application vary according to the crop and its condition (Elik, et al. 2019). Given the long-term effects associated with exposure to chemicals, young people in STEM can innovate safer but equally effective disinfectants to protect the health of workers in the processing sector and to also reduce any environmental damage from the chemicals used.

In Africa, most food processing factories use manual labor to clean equipment. It is timeconsuming to apply chemicals for cleaning and sanitizing factory floors and equipment and requires considerable water. Such manual cleaning processes also may not fully eradicate pathogens. Improved smart automated technologies can apply the right concentration and quantity of chemicals for cleaning and sanitizing food processing lines, as well as efficiently test for the presence of pathogens. Such technologies need to be more widely adopted by agro-processing enterprises in Africa to ensure the safety of both the workers and the food produced. There now are considerable opportunities for increasing capacity development in the use of effective and more affordable water, labor, and energy-efficient cleaning and sanitizing technologies.

Africa could gain up to USD 1.0 billion annually from higher exports of processed foods, livestock products, coffee, nuts, dried fruits, and other agricultural commodities through meeting international food product safety standards and implementing the requisite sanitary and phytosanitary measures. Youth have an opportunity to be part of the effort to unlock access to new markets for agrifood products, upgrade production processes, and create jobs (Malabo Montpellier Panel 2020). Young people need to be trained to ensure compliance with these new market standards during post-harvest handling and processing and to put in place the quality controls necessary to meet the standards. Youth can work with governments to better understand the laws and regulations governing trade in food products to international markets, such as the European Union.

5.4 Markets and trade

The marketing and trade segments of agrifood value chains form critical entry points for employment in the agrifood sector and can stimulate overall economic growth. Food trade can significantly transform Africa's food systems, create employment opportunities for youth, and improve socioeconomic development. It can stimulate demand for agricultural products and the need for more specialized skills, resulting in increases in productivity, supply, jobs, and income (UNECA, AU, AfDB, and UNCTAD 2019, Bonuedi, Kamasa and Opoku 2020). Additionally, easing tariff and nontariff barriers to trade can provide greater diversity in the supply of food items, which would help meet the increasing demand for varied foods in transforming food systems, while also contributing to reducing malnutrition in all its forms across the lifespan (Malabo Montpellier Panel 2017).

Food marketing and trade involving young people is an important avenue to improve linkages between rural areas and cities. The little investment needed to conduct food trade, especially informally, provides an opportunity for youth to create jobs for themselves in agribusiness. However, stronger rural-urban links are crucial to facilitating farmers to sell larger shares of their produce in urban markets. The income generated as a result of these linkages can be invested in, for instance, education to build the capacity of youth or purchasing agricultural inputs to further boost agricultural productivity, increasing incomes which would ultimately contribute to ending hunger and malnutrition in Africa (Malabo Montpellier Panel 2017). Adoption of new technologies can accelerate and strengthen linkages between rural and urban areas for profitable marketing, while also attracting young people to agrifood value chains for trade-related employment opportunities.



In addition, attracting young people to high-value food trade jobs, which typically involve perishable crops, requires strengthening rural transport and storage infrastructure. Improving market access and providing timely and accurate pricing information will enable youth to negotiate better prices with middlemen to obtain greater profits. These improved marketing conditions will further increase the interest of youth in agricultural trading opportunities. While these technical solutions will help increase the involvement of youth in trade, providing youth with role models of successful agricultural traders will also inspire budding entrepreneurs to scale up their trading enterprises and seek out higher-value agricultural trade and export markets in which to sell.

5.4.1 Getting products to markets

The agrifood sector remains the most important employment sector in Africa, providing jobs both on and off-farm. Africa's rapidly growing cities present a significant market opportunity for the continent's 60 million farms. To benefit from this opportunity, African farmers and agribusinesses will need to produce, obtain, and deliver more safe and nutritious food to meet the requirements of the growing populations in Africa's cities and towns (AGRA 2020). The market and trade segments across agrifood value chains can provide significant job opportunities for youth. This includes upstream activities, such as supplying improved seed, fertilizer, and machinery for local food production, and downstream activities, such as offering digital technologies to link farmers to food processors or directly to consumers, as well as linking consumers to processed food products. Responding to growing urban markets and increased demand in transforming food systems for a diversity of food items, including processed foods, requires improved food trade and marketing services. Young people can provide such services. Their engagement in building local agrifood

systems will contribute to reducing the amount of food products imported, while increasing the size of markets for raw produce from small-scale farmers. Both effects advance national economic development.

Direct marketing is crucial for farm businesses, as they face profit challenges and need better marketing and promotional support to sustain and amplify their profits. Various information and communication technologies (ICT) can transform agricultural markets in terms of structure, organization, and functions and also offer solutions to several persistent market failures and information asymmetries common in Africa's agricultural markets (Abate, et al. 2023).

Examples of digital solutions that enable direct food marketing and trade include AgroTrade, which links Ghana's farmers with large buyers and ensures direct trading. AgroMart, on the other hand, enables young people in Ghana to work as distributors, helping smallholder farmers sell their produce at fair market prices (Malabo Montpellier Panel 2019). In Kenya, Farmster is a digital matchmaking platform between smallholder farmers and buyers that works over an SMS chatbot to create market linkages for farmers without internet access (Farmster 2019). In Uganda, TruTrade Africa is a social enterprise that offers smallholder farmers a reliable route to market and fair prices for their produce (Text Box 5.22). Other digital solutions that have provided market access to farmers include Farm Kiosk (Text Box 6.2) and Club Tiossane The latter is an online delivery service in Senegal that provides a market for local food producers by connecting them to hundreds of local businesses. Initially, a homedelivery service, Club Tiossane has evolved into a generalist distributor, aiming to create market opportunities and promote the emergence of agricultural producers and processors by increasing their selling ability (USAID 2023).

Text Box 5.22. TruTrade Africa-offering Ugandan farmers markets and fair prices for their produce

TruTrade Africa has an online and mobile-enabled trading and payment platform for collaborative supply chain management. The platform captures all costs, analyzes transaction viability and price setting, registers farmers, triggers payments, and tracks the produce from collection to delivery. The platform and its digital trading records have also opened up significant new possibilities for farmer and business credentialing and have given global commodity buyers the ability to connect to their smallholder farmer suppliers. Indirectly, TruTrade Africa has increased business opportunities for farmers and rural employment opportunities for young people as village agents (TruTrade 2017).



Despite the numerous digital agricultural marketing tools in Africa, the majority offer only a limited range of solutions and lack novelty. These inadequacies result partly from insufficient human capital in Africa's ICT sector. Hence, there is an opportunity to increase the number of technical and professional youth with advanced ICT skills and entrepreneurial capabilities to increase innovations for improved trade and marketing in Africa and internationally. Building such capacity would result in the creation of new jobs and accelerate economic growth. Such ICT capacity can be built through public-private partnership investments targeting youth, such as the establishment of innovation hubs and ICT business incubators and funding competitive grants, innovation prizes, and other incentive programs. Fundamentally, ensuring reliable local digital connectivity is the foundation for more strongly linking farmers to an expanded set of agricultural markets and trade opportunities (Abate, et al. 2023).

The potential of intraregional trade to generate economic growth is greater when agricultural products are processed rather than simply traded as raw materials. For instance, the export of cocoa butter or chocolate is usually more profitable than exporting raw cocoa beans (Malabo Montpellier Panel 2020). Thus, putting in place enabling environments for agro-processing in the continent is crucial for economic growth and increased employment opportunities for youth in agrifood trade and marketing. To overcome factors that hinder the marketing and trade of processed foods and other food products, governments should invest in, for example, roads and cold storage facilities to enable perishable food items to be safely transported for trade. Such investments can create new jobs for youth as well as increase food security. More broadly to foster entrepreneurship in agrifood marketing and trade, African governments need to ensure the comprehensive implementation of the African Continental Free Trade Area (AfCFTA) agreement. Freer trade opportunities will stimulate the attention and investments of young entrepreneurs across Africa.

5.4.2 Implementation of the African Continental Free Trade Area (AfCFTA): Employment for young agricultural entrepreneurs

Since May 2019, AfCFTA has aimed to create a single market across Africa for goods and services, reduce tariffs, and address non-tariff barriers, like customs delays. When implemented, AfCFTA can help Africa respond to major global trends, provide a framework for coordinated green growth strategies, and ensure policy coherence on digital competition, data governance, and taxation. AfCFTA will boost regional trade and generate employment opportunities for youth, especially in agriculture (Ngom 2023). It is expected to increase trade within Africa by 52 percent, promote integration, improve productivity, generate employment opportunities, and ensure equal opportunities for women and young people (Bekele-Thomas 2023). The UN Economic Commission for Africa predicts it will help the African economy grow to USD 29 trillion by 2050, empowering youth and enhancing the business environment (UNECA 2021).

As reported in the Malabo Montpellier Panel report on trade (2020), case study analyses show the positive effect of intraregional trade on the productivity of individual businesses in Malawi, Rwanda, Senegal, and South Africa. Businesses trading regionally show a higher propensity to innovate and stay in business, a faster growth in labor productivity, and a higher level of total factor productivity, the productivity of all inputs. For example, in Senegal, between 2003 and 2007, the total factor productivity of regional exporters was 60 percent higher than that of those who did not export (te Velde 2015). Moreover, a 2020 ex-ante World Bank evaluation of AfCFTA's impact on employment suggests that its effective implementation could increase the number of workers in energy-intensive manufacturing by 2.4 million, public services by 4.6 million, recreational and other services by 0.28 million, and trade services by 0.13 million. In addition, although the share of employment in the agriculture sector as a percentage of total employment in Africa would decrease under AfCFTA, output volume from agriculture would increase in 15 of 24 countries considered in the evaluation (World Bank 2020a). The ex-ante evaluation estimates that AfCFTA will lead to an increase of USD 211 billion in overall African economic output by 2035-in particular, the services sector would grow by USD 147 billion and the manufacturing sector by USD 56 billion. Although agricultural production would decline by 0.5 percent, the study found that in 14 of the 24 countries analyzed the relative importance of the agriculture sector is set to increase. For instance,



several East African economies would specialize in agricultural production and services, with a reallocation of productive factors to agriculture, including labor and capital (World Bank 2020a).

Initiatives to mainstream youth in the implementation and operations of AfCFTA include the AfCFTA Futures Report, the Africa Youth Month Innovation Challenge, training quides, capacity-building programs, investments, and cross-regional dialogues. Key messages for maximizing youth opportunities in the free trade agreement include recognizing youth diversity in all economies and societies, facilitating market access for youth through youth-owned businesses, and considering youth in policy design and action monitoring (UNDP 2022). AfCFTA can offer young

agricultural entrepreneurs important economic opportunities by allowing them access to larger markets and creating a favorable business environment in which to work (AfCFTA Secretariat 2022). It offers a chance for young people to drive Africa's industrialization and economic transformation through entrepreneurship. Through its Youth Protocol and targeted youth program, AfCFTA acknowledges the potential of youth to lead development across the continent in agriculture, financial technology, ITC, and creative industries (Text Box 5.23). Government and private partners' support in improving infrastructure, access to modern technologies, funding, electricity, and broadband internet will facilitate youth participation in the free trade zone (UNECA 2023a).

Text Box 5.23. Youth Program of the African Continental Free Trade Area (AfCFTA)

The AfCFTA Youth Program aims to unite and prepare young people across Africa with diverse skills and knowledge for key professional and leadership roles in international trade and related fields. The program brings people together to share skills, knowledge, creativity, and learning to build a more integrated continent. Among the program's objectives are engaging youth in the formulation, negotiation, and implementation of trade agreements; providing opportunities for young Africans to serve and gain professional experience in trade policy formulation, negotiation, and implementation; and promoting pan-Africanism and shared values among the upcoming generation (Ngom 2023).

The African Union High-Level Panel on Innovation and Emerging Technologies has urged memberstates to establish infrastructural and policy frameworks to effectively harness innovation and emerging technologies to manage the implementation of AfCFTA. This includes integrating digital technology management platforms on common standards and frameworks into existing export and import infrastructural systems. For instance, technology has significantly transformed cross-border payments in Africa, enabling individuals and businesses to send, receive, and store money across borders. Mobile money platforms like M-Pesa in Kenya and EcoCash in Zimbabwe have made financial services accessible to unbanked and underbanked populations, transforming the financial landscape. Emerging technologies can be transformative in other dimensions of trade to enable seamless

business and trade across African countries, regardless of location. Rehabilitated information and communication technology infrastructure will provide reliable internet connections and robust broadband access, enhancing technological trade platforms for AfCFTA and paving the way for Africa's global trade revolution (AUDA-NEPAD 2021a).

All of this will enable youth to exploit the new economic opportunities and job possibilities that AfCFTA offers, so long as continuing investments are made to enable youth to acquire the skills and knowledge they need to participate in the expanding intra-continental trade flows. Quality STEM education will be a crucial part of unlocking the potential of AfCFTA to bring about a promising future for Africa's youth.

6. CROSS-CUTTING ISSUES IN EMPOWERING YOUTH WITHIN AGRIFOOD SYSTEMS

6.1 Access to information through new technologies and innovations

Access to timely, reliable, and transparent information is crucial to the profitable engagement in agrifood systems by producers, processors, traders, and consumers. Information on commodity prices will better enable producers, traders, and consumers to make informed decisions on what prices they should seek in selling or purchasing produce. Timely and accurate weather forecasts will assist farmers in determining when to plant or harvest their crops. Farmers also will benefit from access to advice on improved farming techniques and technologies. Food processors will benefit from having access to more information on new and more efficient processing techniques, new markets for their products, and information on the food safety and hygiene rules and regulations they must meet to gain access to those markets.

Text Box 6.1. Digital agricultural innovation hubs

Agriculture Innovations Hub, founded in 2019 in Ghana, helps to identify challenges in the agriculture industry and develop innovative solutions. The hub's mission is to foster and implement new technologies or strategies that increase efficiency, conserve resources, or significantly improve the lives of farmers and consumers. It provides incubation support and a co-working space for agricultural entrepreneurs and farmers with innovative ideas. The Agriculture Innovations Hub offers mentorship, training, access to funding, marketing connections, and resources to enable businesses to achieve better growth. The main purpose of the incubator program is to help startups in agrifood value chains to grow (Agriculture Innovations Hub 2023).

Edo Agric Digital Innovation Hub, launched in 2022 in Edo state, Nigeria, is a virtual hub grouping organizations with complementary expertise in agriculture. The hub's public benefit objective is to promote digital transformation, innovation, and climate-smart agriculture (Edo Agric Digital Innovation Hub 2022). Its first consortium includes Edo State Skills Development Agency, Farm Crowdy, HelloTractor, Satsure, Ecotutu, Songhai Labs, and the Nigeria Institute for Palm Oil Research. The Edo State Skills Development Agency equips members with skills training, provides entrepreneurship opportunities, and supports them with workspace, starter packs of inputs, access to funding, access to markets, and publicity tools for their goods and services. Satsure seeks to contribute to the digital transformation of agriculture in Edo State by deploying satellite technology (Space in Africa 2022). Farmcrowdy connects stakeholders with farm produce, inputs, and processed food in aggregated quantities, while Ecotutu delivers fully solar-powered cold storage to farmers and food vendors to sustainably avoid food waste. All companies in the hub provide tools and training to entrepreneurs, students, and other actors in local agrifood value chains.

In partnership with national institutions, FAO has supported the establishment of in-country innovation hubs to support farmers and value chain actors that are linked through the Global Network of Digital Agriculture Innovation Hubs. To extend this work, a sub-program of the Global Network was then formed with funding from the Flexible Multi-Partner Mechanism to accelerate the development of digital innovation in the agrifood sector, mainly through increasing the skills and competitiveness of youth and women (FAO 2022c). Morocco and Ethiopia are the African countries in the pilot for the sub-program.

Numerous initiatives across the continent facilitate the provision and access to information to producers, processors, traders, and consumers, revolutionizing how information is transmitted and who it can reach. Many of these are based on digital platforms. Expanded investments in digital agricultural innovation hubs will foster innovationdriven agrifood systems and facilitate young technical entrepreneurs working in the agrifood sector to develop and disseminate locally adapted agricultural technologies and digital solutions that provide agrifood value chain actors with access to information (Text Box 6.1).

Agricultural extension services are key for providing information, advice, and training on various aspects of agriculture to farmers to improve their productivity levels and incomes. However, most extension workers in Africa have to move from village to village to offer these services. The wide adoption of new digital technologies now enables extension services to be provided to many farmers via mobile phone or smartphones. These changes provide an opportunity for young people to create or use already available apps to offer extension services tailored to local needs. For example, through its app, Farm Kiosk profiles farmers, buyers, and extension workers–specifically agronomists and veterinarians–to help farmers sell their produce and access specialist knowledge (Text Box 6.2).

Text Box 6.2. Farm Kiosk digitally connects actors within East Africa's agrifood systems

Farm Kiosk, headquartered in Uganda, is an agribusiness social enterprise that seeks to create a borderless agribusiness space in Uganda and across East Africa by using a web portal and mobile app. Launched in 2019, Farm Kiosk uses mobile technologies to connect smallholder farmers to markets, certified extension workers with experience in practical agronomy and veterinary services, and farm equipment for hire at a fair price. The app also is used to link landless farmers and entrepreneurs with those with land to lease out for agribusiness in any part of the country (Farm Kiosk 2023).

Farm Kiosk has different profiling features that identify the type of produce specific farmers in different locations deal with seasonally and the anticipated harvest period. Keeping track of the crop growth throughout the season, as the crop comes to harvest Farm Kiosk will use its linkage services to alert a range of value chain actors from pre-production to post-production. To support traceability and compliance with quality and safety standards, the app has a tracking feature to trace products from farm pick-up to the final consumer.

Farmers also can access information on best management practices for crops and livestock in 12 local languages and also trade and track business in those local languages. This facility significantly bridges the digital divide gap in East Africa.

Farm Kiosk aims at making it easier and more attractive for young people to get into farming. It supports and provides employment opportunities for young people from pre-production to post-production. By 2021, Farm Kiosk was working with more than 40 women groups and 20 youth groups comprising 1,530 farmers, 37 business-to-business customers, and over 1,500 business-to-consumer customers spread around seven districts in Uganda (Jackson 2021).

Youth can be both beneficiaries and creators of new digital technologies and solutions to local agrifood system challenges. For example, the EzyAgric App (Text Box 6.3) was created by a group of young people in Uganda to enable smallholder farmers and other agriculture service providers to access information and high-quality production and marketing services (Brand and Galdava 2019).



Text Box 6.3. EzyAgric app supports youth engagement in agriculture

The EzyAgric mobile app was developed by Uganda's youth-led Akorion Ltd. in 2014. Through EzyAgric, Akorion aims to provide smallholder farmers and other agriculture service providers in Uganda with upto-date agricultural information and access to high-quality production and marketing services via mobile technology. Given low mobile phone ownership in rural Uganda, Akorion uses an e-VAM (Electronic Village Agent Model) service delivery model through which youth are employed as village agents and equipped with smartphones to deliver services and gather data from farmers. Using EzyAgric, village agents collect data from farmers–demographic, production, input use, production–and map their cultivated land using GPS.

Akorion provides youth with employment opportunities in agriculture by employing them as village agents (Kawalya 2017). The agents provide extension services to farmers on topics such as better agronomic practices, weather forecasts, market prices, digital financial services, and crop insurance. EzyAgric also acts as a virtual trading center that connects producers, buyers, sellers, input suppliers, exporters, crop insurance, and financial institutions. Digital profiles are created of farmers using the app. EzyAgric uses these to provide customized services and recommendations to those farmers and connects them to vetted suppliers (Anyang 2015, Brand and Galdava 2019). After three years of implementation, EzyAgric had been used to digitally profile 42,000 farmers through a network of 480 village agents and 100 farmer associations.

Similarly, in Ghana, CocoaLink (Text Box 6.4) is a mobile technology platform that increases the information available to cocoa farmers and also helps them to find markets for their produce, resulting in increased productivity, reduced postharvest losses, and more income (Brand and Galdava 2019).

Text Box 6.4. Farmerline's CocoaLink app enables farmers to obtain information vital to their cocoa businesses

CocoaLink is a digital information platform developed by Farmerline in Ghana to increase the access smallholder farmers have to information. Currently, Farmerline reaches over 200,000 farmers in 11 African countries in various ways. In Ghana, the CocoaLink platform uses SMS and voice messages to exchange information with cocoa farmers. Farmerline also conducts outreach initiatives, such as Farm Field Days in partnership with university agricultural programs, through which they expose students to cocoa farming. At these events, youth learn about how they might use the CocoaLink application to harness the power of in-person communication and mentorship to support their farming. Upgrades to CocoaLink have enabled farmers to better document and share information needed for various cocoa-certification programs, which has resulted in their receiving higher prices for their cocoa beans, increased incomes, and improved agricultural productivity. CocoaLink seeks to be a tool to inspire, train, and incentivize young Ghanaian cocoa farmers so that they realize that agriculture can be a profitable and respectable career (Brand and Galdava 2019).

The RiceAdvice and RiceAdvice-WeedManager apps (Text Box 6.5) are used by farmers, extension workers, and private companies involved in rice agribusiness to obtain fertilizer and weed management advice for increased rice production (AfricaRice 2020b, AfricaRice 2020c). The demand for services the apps facilitate can provide increased employment opportunities for young people who can locally provide those specific services.

Text Box 6.5. RiceAdvice and RiceAdvice-WeedManager apps for optimal rice production

The RiceAdvice and RiceAdvice-WeedManager apps were developed by AfricaRice to provide personalized advice to farmers on rice management practices via smartphones and tablets. RiceAdvice helps farmers identify the best fertilizers to purchase for use on their rice based on price. The app then computes the optimal amounts and timing of application of the fertilizer based on the nutrient requirements of the farmer's rice crop. It also selects a target yield level for the farmer based on the farmer's budget. RiceAdvice does not require an internet connection to generate these guidelines. The RiceAdvice app is in use in 13 countries in Africa–Benin, Burkina Faso, Ghana, Mali, Niger, Madagascar, Mauritania, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, and Togo. Use of the RiceAdvice app has also been shown to increase local demand for agricultural inputs and rice processing and marketing services. Evaluations estimate that use of the RiceAdvice app increases yield by about 0.55 mt/ha and profitability by about USD 250/ha (AfricaRice 2020b).

Similarly, the RiceAdvice-WeedManager app provides information to rice farmers about the most effective and cost-efficient strategies to manage weeds in their rice fields, taking into account their individual farming conditions and available resources (AfricaRice 2020c).

The growing market for RiceAdvice and RiceAdvice-WeedManager generated recommendations means there are excellent employment opportunities for young service providers to deliver fee-based services to farmers in response to the personalized recommendations generated for the farmers from mobile phone and smartphone apps.

6.2 Upgrading skill development and training

Training and educating young people so that they canfill the many new employment opportunities that will emerge through the transformation of Africa's agrifood systems must be a political imperative for African governments. This is necessary not only because of the contribution agricultural growth makes to reducing poverty but also the alarming rise of unemployed and underemployed youth on the continent, as highlighted in Chapter 5 (World Bank 2007, ILO 2019b).

Recognizing that education and skills are key factors for the successful integration of youth in the

agrifood industry, this section focuses on the need to urgently upgrade current formal education systems, including vocational, secondary, and tertiary education, to meet the demands of the transforming and rapidly evolving agrifood systems largely triggered by the digital technology-based Fourth Industrial Revolution. Given that Africa's youth are not a homogeneous group and have varying degrees of access to formal education, this section also highlights opportunities for knowledge and skill acquisition outside of formal education systems.

Ensuring that young people are equipped with relevant skills is crucial if youth are to harness economic opportunities that are presented within



each segment of transforming agrifood systems, as discussed in the preceding sections. Only with the requisite skills will young people be able to secure stable, remunerative, and meaningful employment exploit entrepreneurship or opportunities in agrifood value chains (Kubik 2022). The Montpellier Panel published a report almost ten years ago on entrepreneurship in African agriculture (Agriculture for Impact 2014). It highlighted that tremendous opportunities for well-paying employment opportunities will emerge as Africa's food systems transform. However, these opportunities can only be realized if proper investments are made in upgrading education systems and developing sound vocational and business management training for young people to engage across agrifood systems in roles that range from research and development to production and consumption.

With carefully crafted skill development programs and investments, African countries can turn this investment in education into a demographic dividend for economic growth. Researchers at the International Food Policy Research Institute have proposed three categories of professions that encompass the broad set of skills required for agrifood systems to operate effectively (Kirui 2020):

• Core professions that require practical and specialized skills across agrifood systems. These include the production of inputs, like

seeds, fingerlings, feed, and the like, and the provision of processing and storage technology, logistical support, and retailing services.

- Support professions that employ technical skills to support the core professions in agrifood systems from production to consumption. An example of one such profession is technicians in the manufacturing and repair of farm machinery.
- Cross-sectoral professions that do not employ agricultural skills per se, but provide support functions to enable proper agrifood value chain functioning. Such professions include experts in finance, accounting, insurance, communication, and marketing.

While this categorization likely will hold over time, as food systems transform and countries enter green growth and sustainable development pathways coupled with the Fourth Industrial Revolution, new types of employment in agrifood systems will emerge within these categories. These new jobs will require new sets of skills. Governments will need to keep pace with these changes in the types of workers evolving agrifood systems will require to ensure that education programs meet these new needs (Text Box 6.6).

Text Box 6.6. Opportunities of the Fourth Industrial Revolution to transform Africa's agrifood systems

Capitalizing on new technologies, innovations, and enterprising spirit across the continent, Africa has a tremendous opportunity to harness recent advances in science, technology, and engineering-the so-called Fourth Industrial Revolution-to transform its agrifood systems. African youth must be provided with the skills that will enable them to lead in the development and application of emerging digital technologies, automation, and robotics to create innovative businesses that solve problems along agrifood value chains (Berdegué, Trivelli and Corvalán 2023). As the world moves to the digital era, the way business is done is changing in different sectors of the economy including farming and agribusiness (World Bank 2019b). The technologies galvanizing the Fourth Industrial Revolution are a fusion of the digital, biological, and physical worlds, as well as the growing utilization of new technologies such as artificial intelligence, cloud computing, robotics, 3D printing, the internet of things, and advanced wireless technologies, among others (Ndung'u and Signé 2020). These can be used to improve access for all to vital services, such as education, health services, and agriculture technologies.

One example of the potential of this fusion of technologies in agrifood system development is the use of drones to map and analyze soil. This has been done in Nigeria where Aerobotics employs drones equipped with light spectrometers to map and analyze soil, aiding farmers in optimizing crop yields by assessing nutrient levels and moisture content. In Kenya, Precision Hawk uses drones with thermal cameras to detect pests and diseases in crops to facilitate timely action to eliminate them. In South Africa, Aeryon Labs uses drones to monitor livestock health (von Braun 2019, Ndung'u and Signé 2020, AUDA-NEPAD 2023).

As pointed out by the Malabo Montpellier Panel's report "Byte By Byte" (2019), greater digital literacy and skills are essential to harness the opportunities presented by a more technology-driven and digitalized agrifood sector. Skill development and digital readiness need to be strengthened at three levels:

- At the farm level and among other agriculture value chain actors. Training young value chain actors to build and strengthen their abilities to use digital services and solutions should go hand-in-hand with a drive toward building more farmer-centric and locally applicable digital products and services.
- At the next level, digital entrepreneurs will need specialized coding and programming skills to build online businesses and to design and develop new software and hardware. Incubators, accelerators, and hackathons are efforts that can assist in the development of these skills and help connect local aspiring agricultural entrepreneurs with wider global networks and capital. Studies show rising excitement among African start-ups around the power of accelerators to boost human capital (CTA 2019).
- Finally, governments must take the lead in developing and training their own employees-from the most senior officials to local extension agents-to understand and use digital tools and solutions and how to deploy them in various government initiatives. Government officials need know how to use big data to improve the services governments offer to smallholder farmers and rural communities and to improve their policymaking so that the benefits for smallholder agriculture of public investments increase. By taking these steps, governments will better address the current and future economic needs of young people pursuing careers in various segments of Africa's agrifood systems.

Effective attention to all three of these levels will result in tremendous opportunities for young people to create their own enterprises or to seek employment opportunities in transforming agrifood systems across Africa.

In Rwanda, following the adoption of the revised Land Law in 2021 (RoR 2021), which put in place a legal framework to ease access to land services and address the issue of the high cost of lengthy paperwork in land transactions, the government launched in 2023 a new electronic land registration certificate system known as e-Title. In line with the government's goal of "zero trips, zero paper" for land transactions, citizen now have access to automated land services and can get instant access to their land titles through a digital platform named Irembo, which is linked to the national land registry. Moreover, digital land certificates have been embraced by all government and private institutions, including banks, to serve citizens in different capabilities, such as to gain access to loans or agricultural input subsidies (Ministry of Environment 2023). Interestingly, the expansion of digital services has led to a mushrooming of youth-owned digital kiosks and cyber cafes across Rwanda that provide services to digitally challenged or busy people for small fees.

Ongoing education, skill development, and training for all agricultural value chain actors, including youth in both rural and urban areas, will positively affect the development of businesses and economies across Africa. A strong pipeline of talent equipped with the relevant skills and knowledge is beneficial to governments and the business community as it allows those business to innovate and thereby create employment opportunities for appropriately skilled youth that offer high economic rewards. The key for Africa will be to adopt an innovative mindset and focus on skill development to ensure that digital transformation opportunities can be filled-and led-by Africans (AfDB 2016a). Africa must become a creator, and not just a consumer, of technology.

In cooperation with the private sector, the public sector needs to lead the way, motivating and mapping strategic pathways for inclusive agricultural transformation processes that benefit all, but particularly young people and the next generation of agricultural entrepreneurs. Crucially, whether Africa's fast-growing young population will become an economic dividend for the continent's economies will depend on what governments and their partners have to offer in terms of policies, strategies, and programs aimed at not only providing African youth with the skills and tools for employment and leadership but also creating enabling environments for self-employment and entrepreneurship. Universities across Africa need to urgently expand their curricula to include programming and algorithm design if they are to become hubs for serving digital innovations in the food system. At the same time, technical and vocational education and training (TVET) institutions must be strengthened to equip young people with the digital skills they require to develop and effectively use new agricultural technologies and digital services.

6.2.1 Formal education

African higher education institutions are central to youth being able to build the skills that will enable them to apply innovation and entrepreneurship solving the challenges hindering the to transformation and expansion of Africa's agrifood systems (University of Pretoria 2020). However, for this to happen, universities need to work in close partnership with the private sector to ensure that their curricula match the needs of the market (Pretorius and Schönfeldt 2023). Labor market dynamics are leading to a change in thinking about how best to match skills to market requirements. Thus, concerned with the mismatch between the offered skills and the labor market, some African universities have taken bold steps to more closely link universities with industry to improve the relevance of university training for the private sector (World Bank 2019a).

 In Uganda, the School of Food Technology, Nutrition, and Bioengineering at Makerere University initiated a project to impart employable skills to undergraduate students and to upskill young professionals in agroprocessing factories. The Empowerment of the Agro-Processing Industry to Meet the Quantity and Quality Standards for the Local and Export Markets project aims at providing students with the most needed skills in agro-processing industries while also enhancing their critical thinking abilities. To achieve its goals, the project emphasizes learning by doing and involving students in designing, developing, and constructing hands-on solutions to real-life problems. By August 2023, the project had graduated two cohorts of 66 students and 60 agroprocessors (Makerere University 2023).

- In Senegal, Cheikh Anta Diop University initiated the project Entreprendre à l'UCAD (UCAD Entrepreneurship Hub), which aims at creating an enabling environment for nurturing innovations and improving graduate students' employability through entrepreneurship (UCAD 2022). Selected students undergo training and participate in workshops on business management. The students enrolled in the program carry the special status of "Student-Entrepreneur", which confers privileges such as access to co-working space with internet connectivity and mentorships to develop their project ideas. Since its inception in 2022, the 77 participants have created 49 start-ups that are under incubation.
- Similarly, in 2019, the Moroccan Ministry of National Education, Professional Training, Higher Education and Scientific Research approved the statute of Student-Entrepreneur in Moroccan universities. This allows beneficiary students to pursue their entrepreneurial ventures without interrupting their studies (UM5R 2020).

To respond to the demand for skilled labor to make effective use of emerging technologies for



agrifood system transformation, these African universities are taking the lead in providing the training that will enable Africa's youth to master and advance the use of these technologies for economic development. Such efforts need to be expanded in universities across all countries in Africa.

6.2.2 Beyond the formal education system

There is a persistent mismatch between the skills and the knowledge obtained through university education and the skills demanded by firms in rapidly transforming food systems, as shown in Chapter 5. Although some universities are adapting their curricula and offering degrees that are specifically targeted at professions in agrifood systems, there are other opportunities for skill development and training that present viable alternatives to university-based education. These include apprenticeships, vocational training, and industry training that go beyond formal education systems (Agriculture for Impact 2014).

Apprenticeships–Apprenticeships constitute non-academic training through which young people learn skills in a relatively short time under the mentorship of an expert (Teal 2016). Apprenticeships are promoted as a quick-win to impart skills to young people in various African countries using government or private sector facilities and initiatives and often involving South-South exchanges.

- In 2016, the Rwandan Ministry of Agriculture and Animal Resources partnered with Israel's Agency for International Development Cooperation to establish the Centre of Excellence in Horticulture. This serves as a one-stop center for extension agents, youth, and farmers to obtain practical training and quality planting materials (MINAGRI 2019a). Between 2016 and 2019, the Center trained close to 600 beneficiaries.
- The Government of Rwanda also has since 2012 run an apprenticeship scheme for unemployed young university graduates. These apprentices are sent to Israel for 11 months of intensive specialized training on agricultural skills, including horticulture, field crops, irrigation, and animal husbandry. Over 750 have thus far benefited from the scheme (MINAGRI 2019b). Upon return, trainees have been able to secure employment or create their own enterprises. An example is

the Horticulture in Reality Corporation. This firm provides agricultural extension services to commercial farmers and farmer cooperatives. It currently employs over 100 young agricultural graduates (Agrilinks 2020).

- In Ghana, the Ministry of Food and Agriculture initiated a mechanization skill development program, the Driving Seat Program, in 2018. The program was created in anticipation of the government's plan to import and distribute various farm machinery and tractors in rural areas as part of the Planting for Food and Jobs initiative to accelerate agricultural modernization of the Government of Ghana (MoFA 2021b). To ensure that young women would also benefit from the business opportunities arising from the farm machinery, the Agriculture Engineering Services and the Women In Agriculture Directorates of the Ministry of Food and Agriculture jointly manage the program. It seeks to empower youth, particularly young women, through practical training and certification to be able to use and maintain farm machinery and engage in mechanization and machinery businesses. The training modules include equipment operation, maintenance, business opportunities, and bookkeeping. Practical training takes place in governmentowned Agricultural Mechanization Training Centers. In 2018 and 2019, 180 young women participated in the training and received certificates. Sixty percent of the women who received training found employment in commercial farms, training institutions, or agricultural mechanization service enterprise centers (Malabo Montpellier Panel 2023b).
- In Senegal, the AfDB-funded Projet d'appui au Développement des Compétences et de l'Entreprenariat des Jeunes et des femmes (PDCEJ–Project to Support the Development of Skills and Entrepreneurship of Youth and Women) in collaboration with the Senegalese Institute of Food Technology, has developed a package of small-scale food processing technologies for youth and women in rural areas to use to generate income and employment opportunities. The project aims to train 1,000 youth and women and create 200 women or youth-led small businesses by 2023 in several agricultural zones. In 2020, the project trained 200



beneficiaries in food processing in Dakar, Kaolack, Thiès, and Ziguinchor regions. Youth and women are trained on different processing techniques for cereals, fruits and vegetables, livestock, and fish products, as well as on business skills. A 2020 evaluation found that, out of 200 trainees, 28 percent had started their own businesses within four months of completing the training without additional funding (Malabo Montpellier Panel 2023a).

Vocational training-Technical and Vocational Education and Training (TVET) institutions and programs offer important opportunities for young people to acquire solid skills for the professionalization of agrifood activities and enterprises (AUDA-NEPAD 2019). However, most TVET activities in Africa face challenges related to funding, equipment, and quality instructors. These constraints result in the delivery of skills to trainees that are not adapted to local needs and are not well matched with industry and market demands (Kirui and Kozicka 2018). African TVET institutions generally are not able to offer much more than in-school demonstration farms or processing facilities, many of which are under-equipped. TVET trainees generally receive limited exposure to private sector facilities. As a result, more often than not, TVET graduates in Africa remain unemployed or underemployed due to the limited transfer of the hands-on skills that are needed by agrifood enterprises across the continent.

Learning from successful TVET models elsewhere, African governments would gain greatly from significantly more investment in both soft and hard infrastructure in their TVET systems, as well as bringing into the systems quality instructors that can provide the direct skills needed by agrifood industries. This is necessary for TVET graduates to successfully take up employment opportunities or become agricultural entrepreneurs. Examples of successful TVET models globally include the German dual educational system in the agrifood sector (DEULA), which is a skill-building vocational system that consists of an apprenticeship and practice-oriented school for vocational training in the fields of agriculture, horticulture, landscape gardening, and associated professions (DEULA Witzenhausen 2019). Under DUELA, school-based education is combined with certified in-firm or onfarm training (Kirui and Kozicka 2018).

Inspired by the DEULA system, the New Partnership for Africa's Development (NEPAD) in 2012 launched the seven-year Promotion of Technical Vocational Education and Training for the Agricultural Sector in Africa project with the support of the German government. The project aimed at providing policy support to 12 African governments to reform their agricultural TVET systems as a means to promote youth employability through skills development in the agrifood industry. Benin, Burkina Faso, Ghana, Kenya, Malawi, Namibia, Rwanda, Sierra Leone, South Africa, Togo, Tunisia, and Uganda participated. The project encouraged countries to involve the private sector in the design of ATVET curricula to ensure that trainees were equipped with skills that met labor market needs. Under the project, 250 training modules were developed for ten agricultural value chains, including for dairy, horticulture, and aquaculture (GIZ 2019). Over 16,000 people were trained, primarily youth and women (AUDA-NEPAD 2022a).

Other examples of vocational training programs that have proven successful in providing specialized training and skill development for employment in the agrifood sector can be found in Ethiopia, Togo, and Morocco.

- Alage ATVET College in Ethiopia, established in 2002, spreads across almost 3,000 hectares of farmland. It is equipped with practical training farms, demonstration food processing plants, and laboratories. These are used to impart firsthand training in plant science, animal science, natural resources, and animal health. The training curricula are based on a model of 70 percent practical experience in these facilities with 30 percent theoretical training in classrooms. The campus can accommodate 6,000 trainees enrolled in three-year training courses. Trainees include secondary school leavers, development (extension) agents, and technicians (Alage ATVET College 2016). Since its inception, more than 60,000 trainees have graduated from the college (Kirui 2020).
- The Government of Togo created in 2018 L'Agence Education-Développement (AEDthe Technical and Vocational Training Agency) to foster on-farm and off-farm employment in rural areas focusing on youth and women (AED 2019). AED has so far created two vocational training centers-Instituts de Formation en Alternance pour le Développement (IFAD-Alternative Development Training Institutes). The one at Elavagnon focuses on aquaculture (AED 2021), while livestock is the focus of the institute at Barkoissi (République Togolaise 2021). The centers aim to impart direct skills to rural youth and women to enable trainees to obtain self-employment and engage in entrepreneurship. In aquaculture, 235 youth and women have so far graduated and received from the Ministry of Fisheries starter packages, including cages, to start fish farming in lakes. In addition, 180 trainees graduated from the IFAD livestock center at Barkoissi (Malabo Montpellier Panel 2023c).
- In Morocco, strengthening technical education and vocational training in agriculture is a key element of the Plan Maroc Vert (PMV) (Malabo Montpellier Panel 2018). A network of 52 institutions with 24 different training curricula has been set up to improve the uptake and efficiency of workers in Moroccan agribusinesses. Additionally, eight secondary schools prepare young people for baccalaureate degrees in Agricultural



Sciences, and 30 rural middle schools are dedicated to training young people in agricultural technology. These training courses seek to improve the overall understanding of the various employment and business opportunities within Morocco's agrifood systems and to encourage young people to pursue studies or training that would enable them to participate in them. All agricultural vocational training institutions provide apprenticeships to improve the employability of their trainees. Each year, about 10,000 young people receive training in 20 professions.

Agribusiness skill development and training-To establish thriving businesses and create innovations in agrifood systems, including in logistics, agro-processing, and wholesale and retail trade, requires a range of skills. These include abilities in critical thinking, analysis, decision-making, communication, and leadership (Agriculture for Impact 2014, Berdegué, Trivelli and Corvalán 2023). Moreover, management skills are needed to efficiently deploy the financial and human capital elements of businesses (Kirui 2020, Honorati and Johansson de Silva 2016). Many efforts now are being made across Africa to enable youth to develop such skills. Here several of these initiatives are described, coming both from the private and the public sectors:

- INKOMOKO, a business consulting firm founded in 2012 in Rwanda, supports entrepreneurs in acquiring the skills, resources, and networks necessary to successfully grow their businesses (INKOMOKO 2023). The firm offers entrepreneurs-mainly in youth and womenled businesses-training, business-related advice, access to affordable finance, and links to markets. The training provided covers key concepts and best practices in sales and marketing, finance and tax, and loan management. It also offers businesses support in developing and drafting their business plans. INKOMOKO has expanded its activities to Kenya and Ethiopia and now, works with more than 10,000 entrepreneurs. Since 2012, it has served over 40,000 entrepreneurs in Rwanda, over 11,000 in Kenya, and almost 2,000 in Ethiopia.
- @iBizAfrica is a business incubation and innovation center based at Strathmore University in Kenya. The center supports young entrepreneurs to develop their ideas into business solutions through mentorship,

seed capital, legal advice, financial expertise, training, and physical resources (African Union 2020c). Since starting in 2011, over 300 startups, including many involved in agribusiness, have gone through @iBizAfrica incubation programs. It also implements the Food Africa Accelerator program on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). This accelerator aims to support women and youth-owned, agribusiness enterprises by facilitating access to financing, business support, and technology adoption (VC4A 2020). One of the most widely known startups supported through the program is Shamba Records, which uses big data and artificial intelligence to collect data from and process payments to farmers.

- Owing to the high numbers of youth not in education, employment, or training (61 percent) in Taounate Province, Morocco, in 2017 and 2018, the government piloted rural mobile units of skill providers to ensure delivery of employable skills to rural youth, including soft skills and training in entrepreneurship for self-employment (Ibourk and El Aynaoui 2022). More than 5,500 youth were enrolled in the mobile training unit programs. Almost half obtained job and soft skills training, positioning interviews, and self-employment workshops.
- The Rural Youth Employment Support Project (R-YES) project in Rwanda aims to build the technical know-how and entrepreneurial capacities of rural youth to create a skilled workforce for agrifood systems or to enable them to start their own agribusinesses. It uses the national network of Integrated Polytechnic Regional Colleges as training centers. R-YES is implemented by a consortium led by Kilimo Trust, with the Rwanda Youth in Agribusiness Forum and Rwanda Polytechnic. The project builds technical skills through short vocational courses of three to six months offered at the Regional Colleges. This training is coupled with workplace learning and apprenticeship opportunities at agribusiness companies to expose youth to the world of work. R-YES also provides start-up financing to innovative agribusiness start-ups that show strong potential to create new jobs (Kilimo Trust 2020, R-YES 2020).
- Junior Achievement Africa (JA Africa) is one of Africa's largest youth-serving non-

governmental organizations. JA's mission is to prepare youth for their futures, including their employment. It provides youth with hands-on, immersive learning to build their readiness to work, financial literacy, entrepreneurship skills, STEM and economics knowledge, and more. This training empowers young people to nurture their entrepreneurial ideas, sharpen their work skills, and better manage their earnings to secure better lives for themselves. Headquartered in Ghana, JA Africa works in Côte d'Ivoire, Eswatini, Gabon, Ghana, Kenya, Mauritius, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. It annually reaches over 300,000 youth in more than 3,000 schools (JA Africa 2023, 2020).

Text Box 6.7. The Youth and Women Empowerment Project in Zimbabwe

The Youth and Women Empowerment Project (YWEP) is part of the African Development Bank's Rural Microenterprise flagship for its Jobs for Youth in Africa Strategy, 2016-2025. Youth and women in Zimbabwe are provided with business training, access to finance, and mentorship to launch agriculturebased micro-enterprises or to expand existing ones. YWEP has been targeted to mopane worm producers in Beitbridge, honey producers in Marondera and Lupane, artisanal gold ore mill operators in Guruve, and horticulturalists in Marondera. Two hundred enterprises in these value chains have been reached with business development services, appropriate technology, and facilitation of access to credit and markets (ILO 2017b). As of 2023, the project had created over 3,000 long-term jobs and provided training in business management to almost 8,000 youth. In addition, 10 vocational training centers were equipped by the project (AfDB 2023d).

In line with its Jobs for Youth in Africa Strategy, 2016-2025 (AfDB 2016a), the African Development Bank has developed a set of programs, including in the agrifood sector, which are aimed at driving the employability of young people in agrifood systems. These include the Youth and Women Empowerment Project in Zimbabwe (Text Box 6.7) and the Empowering Novel Agri-Business Led Employment program in several countries (Text Box 6.8). These programs provide youth with capital, skills training, and mentorship to support them with launching agriculture-based microenterprises or otherwise finding employment in segments of agrifood value chains.

Text Box 6.8. ENABLE Youth and its AgriPitch Competition

The ENABLE Youth (Empowering Novel Agri-Business Led Employment) program supported by the African Development Bank helps young Africans incubate and scale up their agribusinesses. In addition, the project helps youth obtain financing to grow their enterprises. Currently, this program is implemented in 12 countries and is expected to directly benefit some 22,000 youth.

A central element of ENABLE Youth is its annual AgriPitch Competition. This aims to instill a culture of innovation and to nurture agribusiness innovations that will create jobs and improve livelihoods for youth. The competition involves identifying winning ideas that can lead to new products, businesses, programs, projects, and processes, while engaging all young entrepreneurs who are eager to tackle the challenges in agrifood systems that hinder inclusive economic growth. All business proposals submitted for the AgriPitch Competition go through a rigorous screening process based on specific criteria (AfDB 2023b).

As one example of its success, through this annual competition ENABLE Youth South Sudan from 2016 to 2023 invested in over 750 businesses and created more than 5,000 jobs. In addition, almost 1,000 bankable projects were developed, of which over three-quarters were financed (AfDB 2023c).

6.3 Policymaking and political participation

As Africa's young population increases in size, young people must be better integrated into the decision-making processes that will determine the shape of Africa's agrifood systems of tomorrow. Policy processes must better absorb youth's creative ideas and also better recognize their concerns and the challenges they face. More strongly bringing youth into these discussions and debates offers a significant opportunity for African governments to simultaneously address the challenges of transforming agrifood systems and creating decent employment opportunities for their youth. Yet very little has been done to involve young people in open dialogue and decision-making on matters impacting their lives. Youth are rarely facilitated to participate in political activities and decision-making around economic development priorities, policies, and strategies.

While members of parliaments in Africa South of the Sahara have an average age of 49 years (UNDP 2015), disaggregated data from the latest International Parliamentary Union's report on the representation of young people in national parliaments shows that the proportion of members of parliaments aged under 30 years in Africa South of the Sahara is 2 percent and 21 percent for those under 40 years (IPU Parline 2023). In the Central Africa region, only 1.0 and 13.8 percent of MPs are aged under 30 and 40 years, respectively. In the face of this age imbalance in political representation, the rise of digital technologies and the mushrooming of social media platforms allows young people to more effectively express their concerns and make their voices heard at the political level (Tayo 2023, IPU 2017).

In Nigeria, where almost 40 percent of the population are youth, the efforts of youth activists resulted in the Not-Too-Young-To-Run Act, which removes some of the age barriers preventing youth from running for elected offices. The Act reduced the age qualification for the federal President from 40 to 35 years and for legislators in the federal House of Representatives and the state Houses of Assembly from 30 to 25 years. While challenges remain for youth-such as gaining political party support and financing their political campaignsthe Act enables young Nigerians to make their way more readily into the political arena. Between 2019 to 2023, the number of youth elected increased slightly in both the House of Representatives and in the state assemblies in Nigeria-youth won 14 of the 360 seats in the federal House of Representatives and 92 of 993 constituency seats in the state Houses of Assembly (Itodo 2023).

At the continental level, the YouthConnekt concept has been adopted as a model for young people to directly engage with leaders at the highest level of government, the private sector, civil society, and development partners. YouthConnekt started in 2017 as a simple "Meet The President" dialogue between Rwandan youth and their President. The YouthConnekt Africa hub was launched in 2020 to roll out the initiative in different African countries and to serve as a political forum to engage the concerns and needs of youth. YouthConnekt Africa now has groups in 32 countries. The 2022 YouthConnekt Africa event brought together over 9,000 delegates, including three heads of state (Namibia, Rwanda, and Senegal), a vice president, ministers from many governments, youth development champions, private sector actors, investors, artists, and prominent personalities from the various regions of Africa and beyond (YouthConnekt Africa 2022). The deliberations of the event emphasized unlocking employment opportunities in agrifood systems through the provision of proper skills and technologies to youth and reshaping the narrative on agriculture as a viable sector for investment and employment for young Africans.

Moreover, young people across the continent have taken the initiative to form their own organizations to advocate politically for their interests and to hold their governments accountable for their promises to youth. Examples include the Fédération Nationale des Jeunes Ruraux (FENAJER–Federation of National Rural Youth) in Mali and the Rwanda Youth in Agribusiness Forum (Text Box 6.9).

Text Box 6.9. The Rwanda Youth in Agribusiness Forum's engagement in political advocacy

The Rwanda Youth in Agribusiness Forum (RYAF) was established in 2016 as an umbrella organization of youth organizations operating in various fields of agribusiness value chain (RYAF 2022). The main mandate of RYAF is advocacy on issues hampering youth involvement in the agricultural value chain. RYAF is an active member of the Agriculture Sector Working Group, which is a multistakeholder platform led by the Ministry of Agriculture and Animal Resources of the Government of Rwanda and serves as a forum for policy and strategy discussion. As of June 2022, RYAF Membership included over 550 input dealers and 850 youth in livestock, 360 in agro-processing, 3,000 in crop production, and 50 in ICT for Agriculture.

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In Ghana, young people have creatively initiated the Ghana Youth Agriculture Summit as a forum for policy dialogue on issues affecting youth engagement in agrifood systems. In 2022, a summit was organized in collaboration with the National Entrepreneurship Innovation Programme under the theme "Agriculture - A Solution to Youth Unemployment and Driver for Economic Development". Stakeholders from both public and private sectors participated in discussions at the summit (AgricWealth 2022).

Progress has been made in several African countries to strengthen the active participation, inclusion, and representation of young people in political leadership positions, in the design and implementation of policies, and in international forums. This is reflected in the adoption of international protocols and instruments, as discussed in Chapter 4. However, efforts must be redoubled to ensure that Africa's youth have a voice and that their concerns and needs are adequately reflected in the way policies are designed and implemented if they are to benefit from the transformations now occurring in Africa's agrifood systems.

Several African countries already have ministries with dedicated youth portfolios. However, often these are merged with other sectors, such as sports and culture. For example, while Senegal (MinJeun 2021) and Rwanda (MINIYOUTH 2023) have created dedicated Ministries of Youth, Kenya has a Department of State for Youth Affairs (MYASA 2020). However, youth need to feature more centrally in the design of the institutional structures of African governments.

This chapter has provided a detailed overview of the multiple opportunities for young people in agrifood systems. Many programs are successfully creating opportunities for young people's empowerment in these systems. However, most are unlikely to deliver the necessary impact they seek without scaling up sharply. Governments in most African countries recognize the challenges that youth face in day-to-day life, and several are taking deliberate steps to address them within government institutions. Youth considerations can no longer be an afterthought to programming and policymaking within the context of agrifood systems transformation. Rather, enabling youth to better realize their economic potential should be at the core of any interventions taken to advance transformation processes across Africa.

The next part of the report presents the policy and institutional innovations as well as programmatic interventions that four African countries are implementing to better support youth empowerment and to create employment opportunities.


7. METHODOLOGY

As noted, Africa is the continent with the youngest population-there were an estimated 450 million youth aged 15 to 35 years in Africa in 2020. This number is expected to increase to more than one billion by 2063. Consequently, youth must be at the center of Africa's development, necessitating continued investment in young people through education, entrepreneurship, employment, and youth engagement. As agrifood systems shape African economies, young people will be crucial to sustainable economic transformation across Africa. However, youth face age-specific vulnerabilities, challenges, and economic headwinds. Moreover, youth in rural areas face limited access to education, vocational training, information, jobs, land, finance, and markets (FAO, CTA, and IFAD 2014).

When provided with the right skills and knowledge together with an enabling environment that provides them with access to technology and income-generating opportunities in agrifood systems, young people can contribute to increasing the food and nutrition security of their households and communities, which results in economic growth (Mercy Corps 2017). One objective of this report is to consider the social and economic changes that would occur if more youth attained secondary or tertiary levels of education, sustained growth in agriculture is realized, and an enabling environment is in place for agricultural businesses to flourish. This combination should result in increased employment for youth in the agricultural sector. In exploring the contribution this combination of factors might make to youth employment and empowerment across Africa, we focus on those African countries that have made the largest strides in educating youths to secondary or tertiary levels, in achieving visible growth in agricultural productivity, and in generating youth employment in agriculture.

7.1 Data indicators

In selecting African countries for closer examination in this report to buttress arguments on how to expand youth employment in agriculture, databases from the International Labour Organization and the Food and Agriculture Organization of the United Nations were analyzed. The following key indicators were used to identify countries in Africa that are making important progress in educating their youth, in agricultural sector expansion, and in providing youth with good employment opportunities, particularly in the agricultural sector:

- The percentage of employed youths (15-34 years of age) with intermediate or advanced education (ILO 2023a)–This indicator was chosen on the assumption that educational attainment is an indication of current and future labor productivity. Intermediate education is upper secondary or post-secondary, but non-tertiary, education, while advanced education is defined as any level of tertiary education through the level of Doctoral training or its equivalent (ILO 2023c).
- Youth employed in the agriculture sector as a share of all employed youth (ILO 2023b)-the International Labour Organization defines an individual as having employment if "a person aged 15 years or over has done at least one hour's paid work in a given week, or who is absent from work for certain reasons (annual leave, sickness, maternity, etc.) and for a certain period". This definition includes employees, self-employed individuals, and family helpers, whether formally registered or not (INSEE 2023). The agriculture sector comprises agricultural, hunting, forestry, and fishing activities.
- The annual percentage growth in the Agriculture Production Index (API) per capita (FAO 2023a)-This index shows the level of the aggregate value of agricultural production for each year for a country relative to the base period of 2014 to 2016. The annual quantities for each commodity produced are weighted by 2014-2016 average international commodity prices to compute the aggregate value of agricultural production for a given year. This result then is divided by the average aggregate for the base period 2014-2016 to obtain the index (World Bank 2023b). The per capita index is obtained by dividing the API by the population index or computed directly from per capita production.

The data used for assessing national progress on youth education, employment, and API are from 2017 to 2021. Only countries with employment data specifically for youth were considered in the analyses to select the countries for the case studies presented in this report.

7.2 Selection of countries for report case studies

A three-step approach was taken using the three data variables to select the four countries analyzed in this report (Table 7.1):

Table 7.1: Analysis to identify case study countries in Africa that made good progress on youth education, employment, and agricultural production between 2017 and 2021

STEP 1				STEP 2				
	EDUCATED YOUTH					EDUCATED YOUTH		
		LOW	HIGH				LOW	HIGH
YOUTH IN AGRICULTURE EMPLOYMENT	LOW	Burkina Faso	Benin			LOW	Angola	Egypt
		Lesotho	Botswana				Burkina Faso	Gambia
		Liberia	Djibouti				Chad	Mauritius
		Mauritania	Egypt				Comoros	Namihia
		Senegal Kenya			Liberia	Nigeria		
		Тодо	Mauritius		+			Cavaballas
			Namibia		Ţ			seychelles
			Seychelles		ð		Mauritania	Somalia
			Somalia		GR		Niger	
			South Africa		ITA		Togo	
			Tunisia		API		Tanzania	
	HIGH	Angola	Gambia		R C	HIGH	Burundi	Benin
		Burundi	Ghana		I PE		Côte d'Ivoire	Botswana
		Chad	Nigeria		AP		Guinea-Bissau	Djibouti
		Comoros	Uganda				Lesotho	Ghana
		Côte d'Ivoire	Zambia				Rwanda	Kenva
		Guinea-Bissau	Zimbabwe				r wanua	
		Mali					Senegal	South Africa
		Niger					Sierra Leone	Tunisia
		Rwanda						Uganda
		Sierra Leone						Zambia
		Tanzania						Zimbabwe

Educated Youth= Percentage of employed youths with intermediate or advanced education.

Youth in Agriculture Employment= Percentage of youth employed in agriculture among employed youths. API Per Capita Growth= Percentage growth in the Agriculture Production Index Per Capita. Source: Compiled by authors from ILO (2023a) and FAO (2023a) data

Step 1: Comparison of how countries ranked in their performance for the indicators "percentage of employed youths with intermediate or advanced education" and "percentage of youth employed in agriculture among employed youths". Countries that ranked high in both indicators were identified. These are listed in the lower-right quadrant of the left panel of Table 7.1.

Step 2: Comparison of how countries rank in their performance for the indicators "percentage of employed youths with intermediate or advanced education" and "annual percentage growth in API per capita". Countries that ranked high in both indicators were identified. These are listed in the lower-right quadrant of the right panel of Table 7.1.

Step 3: Countries that scored high for all three indicators in both Step 1 and Step 2 were selected for case studies–**Ghana**, **Uganda**, **Zambia**, and **Zimbabwe**.

The next section provides in-depth analyses of youth employment in agriculture in the selected countries. The discussion of each considers the policy and institutional innovations and programmatic interventions that are contributing toward youth empowerment in agrifood systems in each of the countries.

COUNTRY ANALYSES

Policy Innovations to Create Opportunities for Young People in Africa's Agrifood Systems

This section provides case studies on policy and institutional innovations and programmatic interventions contributing to youth empowerment in agrifood systems in Ghana, Uganda, Zambia, and Zimbabwe.



1. Introduction

Over the past thirty years, Ghana has implemented economic and political reforms that have led to a stable socio-economic situation and substantial economic growth (Owusu, Yankson and Osei 2016). The positive economic trends have fostered increased local and foreign investment. This has led to significant improvements in social, economic, and political structures, more inclusive education services, and reduced inequalities among its population (Commonwealth Secretariat 2021).

Like many nations, Ghana's youth are a strategic asset for nation-building and development. The youth population is rapidly increasing, now making up 36 percent of the total population. Youth are more likely to reside in urban areas than in rural parts of the country (Kwakye, Dadzie and Elmaleh 2022). Thus, the Government of Ghana and its partners have implemented a range of interventions focusing on youth cohesion, empowerment, and development (NYA 2021). These initiatives include free secondary education and vocational training, as well as promoting entrepreneurship and providing job opportunities through programs like the Youth Employment Agency and the National Entrepreneurship and Innovation Program (YEA 2023a). The government aims to increase access to quality tertiary education and skills training for Ghana's youth to meet the increasing demand for a more highly skilled workforce. In 2017, it was estimated that 34 percent of Ghanaians of working age had completed secondary or tertiary education (ILO 2023a).

Ghana's economic development vision recognizes agriculture as an important economic pillar. Fiftytwo percent of the labor force is engaged in agriculture (FAO 2023b). Agricultural productivity is rising-from 2017 to 2021, Ghana's Agricultural Production Index per capita (2014-2016 = 100) averaged 104.9 (FAO 2023a). The country's success in achieving its food and nutrition security goals will continue to be closely tied to the development of agriculture. Ghana's agriculture contributes 20 percent of the country's GDP and employs 60 percent of the population (FAO 2022d). The country's Enabling Business for Agriculture score in 2019 of 50.5 was among the highest of countries in West Africa (World Bank 2019c). Over the past two decades, Ghana has seen significant information communication technology (ICT) penetration across various economic and



social sectors, including business, education, governance, and agriculture. The impact of these technologies on socio-economic activities is significant, contributing to GDP and employment, particularly among the youth. The main drivers of the ICT industry are mobile phones and internet services.

This case study examines the efforts made by the Government of Ghana and its development partners to involve and empower youth in the agrifood sector through various institutional, policy, and programmatic interventions.

2. Institutional Innovations

The Government of Ghana (GoG) has established various institutions to involve and enhance the participation of young people in development sectors, particularly in agrifood systems.

Ministry of Education (MoE). Ghana's Ministry of Education is responsible for all education policies, including apprenticeships and skills acquisition, and for ensuring equal educational opportunities for all citizens. Established in 1957, MoE coordinates education policies, sets standards, and monitors implementation. Its goal is to make quality education accessible to all Ghanaians, thereby supporting human capital and national development. MoE also aims to prepare Ghanaians for work by developing an educational system that promotes problem-solving, creativity, and critical skills through academic, technical, and vocational programs (MoE 2023). The Ministry focuses on providing education for junior secondary school graduates and increasing access to primary and junior secondary schools for all eligible young people.

MoE is implementing a comprehensive reform agenda through a coordinated Education Reform Delivery Framework to transform the education sector and meet Ghana's human resource and development needs. The reforms are to improve learning outcomes, particularly at pre-tertiary levels, and to enhance accountability and equity in access to education at all levels. These reforms are aligned with the Education Strategic Plan (2018-2030) and were approved in November 2018 by the cabinet (MoE 2018a). MoE is further working to improve formal education systems, particularly in making them more relevant to rural students.

<u>GHANA</u>

Case Study

To improve technical and vocational education and training opportunities for youth, GoG works through agencies like the National Youth Council, the Ghana National Reconstruction Corps, the National Vocational Training Institute, the Department of Social Welfare, the Labor Department, and the Council for Women and Development. These agencies and representatives from the Ghana Education Service and seven other training agencies formed a National Advisory Committee on Vocational Training.

National Youth Employment Agency (YEA). The National Youth Employment Programme was established in 2006 to reduce youth unemployment. In 2012, it was relaunched as a public service organization and renamed the Ghana Youth and Entrepreneurial Development Agency. However, a lack of legal support caused administrative issues for the new agency. To address this, in 2015 the Youth Employment Agency Bill was passed into law and YEA was established.

The mission of YEA is to coordinate efforts to create jobs for Ghana's youth. This is achieved through offering training in employable skills and organizing internships to help youth transition into employment. The agency also helps to create job opportunities and job placements for youth (Dadzie, Fumey and Namara 2020). By 2012, around 620,000 young people had been employed or



trained through the program (Ampadu-Ameyaw, et al. 2020). YEA enabled young people to learn a trade and then to receive assistance for two years before exiting its programs. Different modules were developed and implemented based on the needs of the time. In 2018, the President of Ghana announced that over 100,000 young people were engaged in the various modules run by YEA, with 125,000 set to be engaged in 2019. The government also has facilitated the placement of unemployed individuals in vocational and technical skills training, agribusiness enterprises, and ICT firms. GoG has funded YEA through taxes and levies (YEA 2023b, Jumpah, Owusu-Arthur and Ampadu-Ameyaw 2022).

Ministry of Food and Agriculture (MoFA). MoFA is responsible for developing and implementing policies and strategies for the agriculture sector (MoFA2023).Thegovernment'svisionforagriculture in Ghana is a modernized sector, resulting in a structurally transformed economy with food security, significant employment opportunities, and reduced poverty. MoFA promotes sustainable agriculture and thriving agribusinesses through research, technology development, and support services for farmers, processors, and traders. As agriculture is the mainstay of the Ghanaian economy, impacting poverty reduction, rural development, social stabilization, environmental sustainability, and economic stability, the ministry



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also aims to industrialize agriculture, increase food security and employment opportunities, and lower poverty rates. Its mission is to support producers, processors, and merchants to enhance their living standards through technological advancements, research, and efficient extension services.

MoFA promotes youth participation in the agricultural sector to change the negative perception of farmers as uneducated, unskilled laborers with low economic returns by introducing youth-focused initiatives, such as the Youth in Agriculture Programme (MoFA 2011). Through efforts to support the emergence of a modern agriculture sector in Ghana, MoFA also offers career opportunities for youth in research, environmental protection, financial management, engineering, and other technical areas to change the negative perception of farmers as uneducated, unskilled laborers.

Ministry of Youth and Sports (MoYS). The Ministry of Youth and Sports, mandated by the Civil Service Act 1993, is tasked with formulating and coordinating youth and sports policies in Ghana, ensuring their efficiency and effectiveness for national integration and international recognition (MoYS 2023). Focused on three functions-sports development, youth development, and sports promotion-MoYS is to provide effective leadership in policy formulation, coordination, implementation, monitoring, and evaluation, while fostering greater public-private sector participation. The ministry has three central agencies-the National Sports Authority, the National Sports College, and the National Youth Authority. These operate to promote youth empowerment through promoting effective youth and sports organizations, fostering youth participation in socio-economic and political development, and facilitating investments in youth and sports from private and third-sector providers.

National Youth Authority (NYA). Established in 1974 under the auspices of the Ministry of Youth and Sport, NYA is Ghana's lead youth sector organization, providing guidance, support, training, and staff development opportunities for youth workers and organizations (NYA 2022). Its mission is to promote youth participation in cultural, socioeconomic, and political development through appropriate technology and highly motivated professionals. NYA coordinates and supports youth empowerment initiatives in Ghana to promote the development of the country's youth. Its objectives include:



- Developing the creative potential of youth,
- Instilling a sense of nationalism and civic responsibility in them, and
- Involving the youth in the country's development by mainstreaming youth development issues into national development frameworks.

The Authority formulates policies and implements programs to achieve its objectives among the youth. To ensure effective coordination, NYA has a reviewable National Youth Policy with action plans to guide its implementation. Its staff comprises specialists in youth work who support youth professional development in person or via online training.

NYA also fosters stakeholder interest in skills training, employment, and market information for youth to provide a conducive environment for their entry into the workforce and participation in the Ghanaian economy. Additionally, the agency cooperates with youth organizations in other countries, develops mechanisms for youth participation in decision-making, establishes and supervises youth leadership and skills training institutes, and organizes annual youth conferences. These activities strengthen the link between educational institutions and the labor market, promote youth participation and universal ethics, and reduce violence and crime among young people (GoG 2023).

NYA has given young people economic and livelihood empowerment training to combat poverty and social problems. In 2018, NYA launched a project in collaboration with the Accra Digital Centre and the Ghana-Indian Kofi Annan Centre of Excellence in ICT to provide digital marketing, ICT, and entrepreneurship training to over 3,000 unemployed youth. This initiative aims to benefit young individuals from urban and rural areas, including those with disabilities, by providing them with job-creation skills (Larnyoh 2018). In 2021, NYA trained 50 vulnerable youth, primarily women and persons with disabilities, from the Bongo District in the production of liquid soap, pomade, beads, fabric, and leather wear, as well as in packaging and marketing skills to help them attract customers and meet market demands (MyInfoGh 2021).

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Ministry of Local Government, Decentralisation and Rural Development. The Ministry and its departments and agencies ensure good governance and balanced development of Metropolitan, Municipal, and District Assemblies. Its mandates and structure are derived from the 1992 Constitution and section 12 of the 1993 Civil Service Act. The Ministry is responsible for promoting government policies and projects. It also works to improve governance and promote balanced development in rural areas (MoLGDRD 2022).

In 2018, through its Department of Community Development, the Ministry offered training to almost 5,000 young people to improve their technical and vocational skills (MoLGDRD 2019). The training was also conducted in subsequent years with 3,000 trained in 2019 and 2020 and 3,500 in 2021 and 2022. This training is designed to help youth find employment and create job opportunities, ultimately reducing poverty. The training has been conducted in 25 different locations countrywide.

The Ministry's local-level development and management programs aim to stimulate social and economic growth in rural communities by involving community members in reducing poverty, creating jobs, and improving literacy rates among adults and young people in rural and disadvantaged urban areas. It also works to establish guidelines and goals for community development. It promotes vocational and technical education and training to young people to reduce rural-urban migration and enable them to lead fulfilling lives in their local communities (MoLGDRD 2019).

3. Policy Innovations

International and regional initiatives aimed at promoting youth development and empowerment operate in Ghana. These efforts are supported by national policies specifically tailored to the local context. Indeed, to involve young people in the country's economic growth, Ghana primarily focuses on their employment and on increasing their participation in the economy. Young Ghanaians view economic management and unemployment as the two most important problems requiring government action (Torsu and Asiamah 2023).



Ghana Poverty Reduction Strategy (GPRS). GPRS ran in two phases from 2003 to 2009 and was a significant step in Ghana's socio-economic development planning and programming. It became an effective tool for development programming, inclusive dialogue, partnerships, and resource mobilization. The strategy was aligned with major development assistance frameworks (GoG, ILO, & UNDP 2004). It included specific policies, strategies, programs, and projects to create wealth through economic management, sustainable livelihoods, human development support, and private sector involvement. The strategy aimed to stabilize the economy, create jobs, and empower all Ghanaians to participate in wealth creation. It ensured access to essential social services and expanded participation in decisionmaking processes, regardless of socio-economic status or location (GoG 2003). In financing activities under the strategy, priority was given to infrastructure (roads, energy, ICT), modernized agriculture, enhanced social services, good governance, and private sector development.

The first GPRS was implemented between 2003 and 2005 to boost the country's economy and improve the lives of its citizens. Developed after consulting with young people and other important stakeholders, its primary goals were to achieve sustainable economic growth, reduce poverty, and protect vulnerable groups within a decentralized democratic system. Significant progress was made in achieving the goals of the first GPRS.

One specific area of focus was agriculture and encouraging more young people to get involved in the sector by providing them with modern tools, technologies, and support services, such as credit and tractor services. Agricultural research institutions also collaborated in efforts under the strategy to offer farmers improved crop varieties and animal breeds. Additionally, there were efforts to create job opportunities for young people in aquaculture and to establish microfinance institutions to improve their access to credit. Legislation was introduced to make it easier for youth to access land. The first phase of GPRS also aimed to enhance technical and vocational education and training (TVET) to improve skills development, including increasing the number of TVET institutions in the country over time (GoG 2003). This included training on elements of agriculture and agrifood systems.

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After the successful implementation of the first phase of GPRS, the second phase ran from 2006 to 2009 to extend the achievements of the first phase and overcome its limitations. The second GPRS aimed to create better job prospects, especially for young people and vulnerable populations. The focus was on modernizing agriculture and improving rural infrastructure to support youth employment in the agricultural sector. The poverty reduction strategy additionally aimed to address several key issues to improve competitiveness in private-sector agriculture. These included reforming processes for land acquisition, expanding irrigation facilities, crop development, livestock production, and improving access to mechanized agriculture (Ampadu-Ameyaw, et al. 2020). Overall, the implementation of the GPRS across its two phases achieved significant success-13 of the 16 indicators monitored under the productive and gainful employment theme of the Strategy showed significant improvement.

Shared Growth and Development Ghana Agenda (GSGDA). After extensive consultations on its design with various stakeholders, including young people, GSGDA was introduced in 2010. The program, implemented in two phases, aimed to increase food production, improve nutrition and security, and create sustainable job opportunities (GoG 2015). To achieve these goals, the government increased funding for agriculture through the Agricultural Development Fund. Several actions were taken to address the specific challenges faced by young people, including coordinating the youth-directed actions of different ministries, departments, and agencies, promoting trade and investment, providing training and skills development, and implementing appropriate labor laws. The Youth in Agricultural Program and



the Savannah Accelerated Development Authority were important initiatives under GSGDA that aimed to encourage young people to participate in agriculture.

Ghana Education Reforms, 2018-2030. The Ghanaian government has launched a significant education reform through the Education Strategic Plan (ESP 2018-2030). ESP is to improve teaching and learning and empower the next generation through their achieving better educational outcomes (MoE 2018a). Before the tertiary education level, Ghana's education system consists of basic education (kindergarten for two years, primary for six years, and junior high school for three years) and secondary education (senior high school or technical/vocational education for three years). ESP 2018-2030 has three main objectives: improving access to inclusive education, enhancing teaching and learning quality, and ensuring sustainable management and accountability.

These reforms align with the Education Strategic Plan for Ghana (MoE 2018b) and the global Sustainable Development Goals that focus on improving learning outcomes, accountability, and equity in education. The reforms aim to make the education system more relevant to national development priorities and adapt to changes in technology and knowledge. They also aim to set clear standards for teaching, learning, assessment, and grading, professionalize teaching, and ensure these standards are met. The reforms include transforming teacher education, reforming the curriculum, making legal and regulatory changes, improving technical and vocational education, decentralizing basic education, and integrating ICT in education. The Ministry of Education oversees the implementation of these



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reforms through the National Education Reform Secretariat. The reform initiatives are coordinated and chaired by the National Reform Coordinator in the Secretariat. The Secretariat provides oversight to ensure that all activities of the Ministry are aligned with the ESP, to hold reform participants accountable, to provide support, and to address any challenges arising. Specific goals related to learning outcomes, accountability, and equity are set for all agencies and departments within MoE, demonstrating Ghana's commitment to improving education quality for all children.

Ghana has made significant progress in reforming its education system, particularly in secondary technical and vocational education and training. A policy for free secondary education was implemented in 2017. This has improved the access of youth to secondary education, with increased enrollment from junior high school to senior high school from 68 percent to 78 percent, without affecting teacher-to-student ratios. More students are also enrolling in kindergarten and primary school. Notably, gender equality exists in all levels of education before university (World Bank 2018).

National Youth Policy of Ghana. Ghana has implemented various policies and programs over the years to create job opportunities and support the development of young people. This includes initiatives such as the Workers Brigade, Operation Feed Yourself, and the National Youth Employment Programme. The government's vision is to empower young people to contribute to the country's development. This is to be achieved through encouraging their involvement in society, promoting self-development, and including them in decision-making processes.

Youth employment has been a significant focus of development policy in Ghana since 2000. The National Youth Policy of Ghana, first implemented in 2010 and updated in 2021, is designed to empower and positively impact the country's development by providing guidelines for implementing policies and demonstrating commitment to international agreements regarding youth (MoYS 2010, NYA 2021). It aims to involve youth in productive activities, help them reach their potential, involve them in decision-making, and promote learning and networking. The National Youth Policy focuses on agriculture, employment, entrepreneurship, education, technology, and gender equality. The



policy specifically encourages young people to participate in modern agriculture as a career and economic option, committing the government to support their involvement in the sector.

The policy also encourages youth creativity, innovation, and self-discovery to improve their quality of life and instill in them democratic values and responsibility. Government will partner with stakeholders to develop interventions and services that equip youth with knowledge, skills, attitudes, values, and ethics. GoG and stakeholders are responsible for providing resources that will enable youth to contribute to economic, social, and cultural advancement. In this context, the policy provides guidelines for implementing plans, programs, and projects for youth development and demonstrates the country's commitment to international conventions and charters affecting youth.

The government also recognizes the importance of science, technology, and innovation in addressing youth challenges and has developed a national policy to integrate these fields into youth development efforts. The implementation of the Youth Policy in Ghana has had positive effects– creating employment opportunities, offering training, and giving valuable experiences to youth (Kwarteng 2021).

National Science, Technology, and Innovation (STI) Policy. GoG introduced in 2000 the first National Science and Technology Policy. This policy was aimed at improving the expertise and capabilities of the country's workforce. The strategy focused on using science and technology in all aspects of society, including promoting the inclusion of women in science and technology fields and addressing the economic and social challenges to doing so. It also encouraged cooperation between government and industry. The policy emphasized that for Ghana to achieve middle-income status by 2020 would require increasing the number of students studying science-related subjects (Amankwah-Amoah 2016).

The National Science, Technology, and Innovation Policy was relaunched in 2010 to promote the development and use of science, technology, and innovation in Ghana's national development strategy (MoEST 2010). The policy aims to create favorable conditions for these fields to thrive. The Ghana Academy of Arts and Sciences and the

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Centre for Scientific and Industrial Research were designated in the policy as key contributors to STI development in the country. To advance STI development, the government provided about 60,000 laptops, 100,000 computers, and 5,000 scholarships to support students in adopting new technologies to close the ICT gap in the country (Modern Ghana 2012).

The main focus of the STI Policy is to ensure that science and technology play a significant role in every sector of the economy. The policy document outlines the strategies and guidelines GoG will pursue to utilize STI for economic growth and youth development. Specific STI-focused programs and strategies are implemented by specific government agencies based on the overall STI policy. It aims to address youth challenges by applying solutions that leverage STI. The interventions include promoting innovation in education, encouraging youth to utilize their technical and scientific capabilities, organizing competitions and award schemes to reward innovation, providing scholarships for science students, promoting science education, identifying talented young scientists, and establishing mentoring programs in STI for the youth.

The Ministry of Environment, Science and Technology manages and implements the government's policies on STI. An apex coordination body within GoG was also established to advocate



for STI investments and development initiatives, provide advice, and coordinate the nation's STI policies.

Under the STI Policy a venture capital fund administering authority has been established to promote venture capital investments in both private and public sector development. The fund aims to commercialize new technologies that emerge from the work of scientific and technological institutions and to encourage public and private procurement of STI products and services. GoG encourages private sector participation in science and technology management as a way to promote knowledge sharing and advance socio-economic development (UNIDO 2012).

However, due to limited resources, GoG's vision for promoting science and technology has not yet been fully implemented (African Center for Economic Transformation 2023, Adomako, Quansah and Mensah 2022). Nonetheless, the government's commitment to youth development and empowerment has not been in doubt, especially with the promotion of science and technology education reaffirming its national commitment (Amankwah-Amoah 2016). Amid resource constraints, significant progress has been made within the sector (Buabeng-Andoh 2019). A significant increase in enrollment in science and technology-related courses at the tertiary level occurred between 2003 and 2018, especially for



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females (Appiah-Castel, et al. 2020). Numerous public universities in Ghana now provide degree programs in science and technology-related fields, including computer science, computer engineering, and telecommunication engineering (UNCTAD 2011).

ICT can benefit Ghana's young people by enhancing their development and employment opportunities. However, it is crucial to address underlying problems, such as gender disparities in accessing ICT. ICT policies need to be flexible and adaptable to accommodate advancements in technology. Furthermore, it is essential to support initiatives that educate young people about privacy invasion, identity theft, online scams, and exposure to offensive content (Commonwealth Secretariat 2021).

National Employment Policy (NEP). GoG youth acknowledges the importance of employment for socio-economic development by accelerating decent job creation through sustainable growth in all sectors of the economy, including the agrifood sectors. Therefore, in 2015, Ghana launched the National Employment Policy (NEP) to tackle unemployment issues, focusing on creating decent job opportunities for youth and vulnerable groups, like women and persons with disabilities (MoELR 2014). The Ministry of Employment and Labour Relations led the development of the policy (Ampadu-Ameyaw, et al. 2020).

NEP aims to create more jobs, improve living conditions and job quality, increase productivity, and strengthen labor administration. It also aims to contribute to economic growth and ensure fairness and security. The policy specifically targets reducing unemployment among youth, early school dropouts, graduates, women, and persons with disabilities. It prioritizes strategies for creating jobs through targeted policies and programs and promotes an enterprise culture. To achieve these objectives, NEP proposes increasing skills training, improving technical and vocational education facilities, promoting programs that employers demand, and collaborating with industry to design relevant curricula. The goal is to better connect the education system with the economy and expose students to the realities of the workforce.

The policy outlines several key issues to address to reduce unemployment. These include rising youth unemployment despite economic growth and reducing seasonal unemployment in rural communities. Underlying these challenges are more systemic issues, including rising unemployment, especially among young people, rapid population growth, limited links between productive industries, a non-competitive private sector, a dominance of informal sector jobs in Ghana's labor market, insufficient resource mobilization, overemphasis on academic education as a job qualification, unemployment among rural farmers, inadequate labor administration capabilities, and a lack of



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reliable labor market information for decisionmaking and planning purposes. The government acknowledges the multifaceted challenges faced by youth. The NEP calls for a multi-sectoral approach to address them, acknowledging the need for a comprehensive approach to create sustainable employment opportunities (Ampadu-Ameyaw, et al. 2020). NEP identifies job creation opportunities across all economic sectors and establishes a framework for facilitating job creation, especially for youth, through coordination and collaboration among sectoral policies and interventions (Hanson 2022). The government's commitment is evident in its efforts to address these issues and improve the quality of employment opportunities (Taylor Crabbe 2020).

It is important to note that the Coordinated Programme of Economic and Social Development Policies, the National Medium-Term Development Policy Framework, and the National Green Jobs Strategy prioritize youth employment in line with Ghana's National Economic Policy and aim to overcome supply and demand constraints. They focus on skills development, entrepreneurship, and job creation in the agriculture, infrastructure, light manufacturing, and transportation sectors (ILO 2023d). A recent report from the World Bank showed that agribusiness, entrepreneurship, apprenticeship, and construction are among the sectors that can provide more job opportunities for young people in Ghana (World Bank 2020b).

4. Programmatic Interventions

Besides institutions and policy innovations, several programs have been implemented to encourage youth to participate in Ghana's agrifood sector. Young people make up a significant portion of Ghana's population, and the government has implemented various initiatives to cater to their needs, such as free secondary education, job training, and agriculture programs. The country is repositioning its education system to produce a more knowledgeable and empowered Ghanaian population with relevant skills for socio-economic transformation.

Youth in Agriculture Programme. GoG, through MOFA, launched the Youth in Agriculture Programme (YIAP) in 2009 to address the negative perception of the agriculture sector that prevails among young people (Twumasi, Jiang and Acheampong 2019). The program is a significant



step taken by GoG to provide jobs for unemployed youth. Its initial goal is to facilitate food and nutrition security to increase employment, particularly in rural areas. The program's main goals, as stated by MOFA, are to encourage young people to see farming as a profitable business, generate sufficient income for their daily needs, improve their living conditions through higher income, and motivate them to remain in rural areas (Charles 2014). Thus, YIAP encourages youth to consider farming as a commercial venture, thereby pursuing farming as a life-long vocation.

The program provides employment opportunities through tractor services and agro-inputs, generates income to meet farmers' domestic and personal needs, improves their standard of living, encourages youth to stay in rural areas, and encourages the production of enough food crops, meat, and fish using modern methods (YPARD 2013). It encourages youth to adopt farming as a commercial business to improve living standards by providing credit-based but interestfree inputs at their farm gates (MoFA 2011). The beneficiaries received free land, which was also plowed for them. The beneficiaries were also given agrochemicals on credit by MOFA. Providing land and agrochemicals was the principal motivation for beneficiaries to participate in YIAP.

Through the program, young farmers are organized in cooperatives, enabling them to access government input credit without collateral. They work with relevant government agencies and departments to secure land from the government or village. YIAP offers productive alternatives for youth engagement, reducing crime and social problems, diversifying farming practices, introducing new crop varieties and animal strains, reducing soil pollution, and reducing rural-urban migration. Regular advice and supervision from MOFA aims to help reduce soil degradation. Over 11,000 youths are engaged in the program in the three northern regions and the Volta Region, using over 28,000 acres for maize and rice (MoFA 2023).

Next Generation Cocoa Youth Programme (NGCYP), 2016-2020. Also called the MASO program, NGCYP was a five-year program supported by the Mastercard Foundation and implemented by Solidaridad, Ashesi University, the Ghana Cocoa Board, Aflatoun, Fidelity International, and Opportunity International. It focused on the creation of sustainable employment

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opportunities in the agriculture and construction sectors for youth aged 18 to 25 years in Ghana's cocoa communities (Ashesi University 2017).

The program consisted of three components:

- Agro Academies in cocoa-growing regions to equip young people with knowledge and entrepreneurial skills,
- Business Academies for young entrepreneurs to start businesses in cocoagrowing communities, and
- MASO Connect to connect youth to exchange knowledge on best practices and to enable them to create a common political voice on issues affecting young people.

The overall goal of NGCYP was to assist over 200,000 poor Ghanaian youth, including those living under the USD 2.00 per day poverty line, to equip them with the skills to become successful farmers and agricultural entrepreneurs in the cocoa sector. NGCYP also aimed to create a supportive environment for the youth by enhancing their access to land, finance, and markets, thereby reducing barriers to their economic success.

Cocoa production is crucial for Ghana's economy, contributing 3 percent to its GDP and supporting the livelihoods of 4 million farming households (GSS 2014). NGCYP connected young people with quality employment in the cocoa sector or assisted them in starting cocoa-related businesses. This was done by offering them training as skilled farmers or entrepreneurs. These efforts also assisted existing cocoa-related businesses to grow, thereby expanding local employment opportunities (Aflatoun 2020). Additionally, the program aimed to promote gender equality and women's empowerment by involving both men and women in its activities. It achieved 40 percent female participation in all interventions, thereby reducing gender inequality, improving the business skills of young women, and enhancing their involvement in income-generating activities (Dabire 2018).

NGCYP implemented two academies-the Agro Academy, which trained cocoa farmers in best farming and marketing practices, and the Business Academy, which trained service providers in the cocoa sector. The academies offered entrepreneurial life skills, mentoring, and coaching. In the program's first year, over 4,500 youth participated in the two academies, with nearly 2,000 graduating as cocoa farmers or service providers (Asamoah 2017). By the end of the program, over 11,000 youths in cocoa-growing areas of Ghana were trained and mentored under NGCYP through the Agro and Business Academies in farming practices, life skills, financial literacy, agricultural inputs, and digital technology (Solidaridad Network 2020, MASO 2019).

Rural Enterprises Programme (REP)–Phase III. The third phase of Ghana's REP, implemented between 2012 and 2020, aimed to improve the living conditions of poor rural entrepreneurs by building their capacity through training in agroindustry and traditional craftsmanship, creating a





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conducive environment for business generation and job creation, and facilitating access to rural financial services. The Ghanaian government supported REP III through loan and grant financing obtained from the African Development Fund. REP III was designed to create 100,000 new jobs through its different activities designed to support agricultural modernization and micro and smallscale enterprise development in 161 of the 170 rural districts in Ghana (ADF 2012).

REP III consisted of four components: business development services, agricultural commodity processing infrastructure services, a service focused on creating an enabling business environment, and program coordination and management. The program focused on inclusive growth, youth employment, and women's economic empowerment. REP III also aimed to improve the financial stability of rural individuals engaged in small business ventures, particularly youth, women, and people with disabilities. This was achieved by helping these entrepreneurs increase their profits, expand their businesses, and, in turn, create more job opportunities by fostering business development, promoting improved commodity processing infrastructure and technologies, and building skills for private sector development (AfDB 2013).

REP III sought to improve its beneficiaries' technical and entrepreneurial skills through capacity building. This included offering business advice, training in technical skills, access to financing through grants and loans, and improving the capacity of organizations that support small businesses. Additionally, REP III sought to improve its clients' income, wealth, nutrition, and resilience indicators, particularly for women and youth, by generating good job opportunities for young people.

REP III also worked to improve financial inclusion and to build the capacity of rural entrepreneurs. Its clients were found to be more likely to have a bank account and to apply for and secure loans than the comparison group of non-participants in REP III. The program helped micro and small enterprises better meet collateral requirements so they could access larger loan sizes. This is important in Ghana, where the cost of credit is a barrier to investment and private sector development. REP III also improved business management skills among rural entrepreneurs through vocational training



and apprenticeships that involved developing skills in bookkeeping and financial management (Boukaka, et al. 2022).

Furthermore, two funds were established for youth under REP III. The Youth Business Development Fund aimed to help young people by giving them loans from participating financial institutions worth 30 percent of their total investment. The Graduate Youth Challenge Fund focused on supporting innovative and scalable projects in agribusinesses and ICT that can solve problems in agricultural value chains and create job opportunities in rural areas. Additionally, the component of REP III on building an enabling environment included a subcomponent to enhance institutional capacity and promote policy dialogue (Boukaka, et al. 2022).

National Entrepreneurship and Innovation Programme (NEIP). Also known as the Youth Enterprise Support program, NEIP was established in 2016 by the Ghanaian government to offer comprehensive support to startups and small businesses. The program offers young entrepreneurs looking to start or grow their small and medium-sized enterprises financial assistance, expert guidance, startup incubator and business development services, and funding. NEIP is aligned with Ghana's vision of becoming a middle-income country with a strong economy that generates sustainable jobs for development. The program begun with an initial capital fund of over USD 830 million. In 2017, the program was expanded and rebranded to provide young entrepreneurs with a broader range of services. The 2019 national budget allocated over USD 3.9 billion to the program. By 2023, NEIP had trained 45,000 entrepreneurs, funded 9,350 businesses, and created more than 92,000 jobs (NEIP 2023a).

A small percentage of senior high school students are interested in starting their businesses, but most believe they must go to college to get a job. However, not all students can afford or access higher education, leaving many unemployed. To address this issue, the Student Entrepreneur Initiative was established under NEIP in 2017 to support senior high school graduates with viable business proposals (NEIP 2023b). The initiative provides these young entrepreneurs with financial support and low-interest loans, with a particular focus on agribusiness proposals. In 2018, the initiative supported 1,300 student entrepreneurs. In 2019, the initiative offered about 50,000 young people with skills development, training, and financial assistance.

5. Conclusion

Ghana's experience has shown that it is essential for a country to take ownership of its development strategies if it is to implement and monitor them effectively. In addition to macro-stability, investments in institutions and infrastructure are crucial for growth, while political and corporate governance reforms are necessary to create a favorable investment climate (GoG 2007). To support and strengthen the involvement of young people in its agrifood systems, GoG has implemented various policies and established a number of institutions. These have been reinforced by flagship programs emphasizing education, skills and capacity building, entrepreneurship, job creation, good governance, and balanced development. These efforts will better enable Ghana to meet emerging economic challenges and to integrate young people into its economic development. Its youth are urged and supported to make the most of growing economic prospects in agriculture.

Ghana's National Development Plan incorporates initiatives and policies promoting youth leadership and employment. Through solid and innovative national policies and programs, Ghanaian youth are encouraged to seize emerging opportunities in the agricultural sector. Involving young people in decision-making and addressing their needs has several advantages. It ensures that policies, programs, and projects are better tailored to their requirements, as their opinions are considered during the planning, execution, and evaluation stages. Furthermore, actively involving young people in finding solutions to their problems helps them develop skills and prepares them for leadership positions in the future (Hoetu 2011).



To increase youth participation in agriculture in Ghana, a support system that guarantees exposure to and participation in agricultural investment and self-employment for youth in rural, peri-urban, and urban areas is crucial. Additionally, Ghanaian authorities need, first, to implement and strengthen comprehensive youth employment strategies to change youth perceptions about economic opportunities in Ghana's agrifood systems (Allen, Howard et al. 2017). Second, to make agriculture appealing to youth, significant investments in education should be made to enable youth to be successful agricultural entrepreneurs. These include ICT innovations in the agrifood system to advance value chains and provide new employment opportunities, enhance access to the market, improve market and rural infrastructure, and reinforce business environments. By adding these efforts to what already is being done to engage and maintain young people in the development of its agrifood systems and, therefore, in its socio-economic development, Ghana will reaffirm its position as a leader in Africa in designing and implementing policy innovations for the sustainable development of the continent and the economic success of its youth.



1. Introduction

Uganda has an estimated population of 43 million, of which 51 percent are women. It has the second youngest population in the world after Niger-74 percent of its population is aged 30 years or younger (UBOS 2021, Statista 2023c). Youth, defined as those aged from 15 to 35 years, constitute 34 percent of the country's population (33 percent of males; 36 percent of females) and 62 percent of its working-age population aged between 14 and 64 years. Uganda's economy largely depends on agriculture, contributing almost 40 percent of its total GDP, 60 percent of employment, and over 90 percent of its foreign exchange earnings (FAO 2021b). Between 2017 and 2021, Uganda's Agricultural Production Index per capita (2014-2016 = 100) averaged 101.7 (FAO 2023a).

Uganda has achieved some of the Malabo Declaration commitments to foster accelerated agricultural growth. For example, the second CAADP biennial report of 2020 showed that Uganda was the only country on track on all measured indicators under the Malabo commitment to end hunger in Africa by 2025 (African Union 2020d). The third CAADP biennial report in 2022 also showed that Uganda was on track on some indicators under the commitment to end hunger, such as increased access to agricultural inputs and reduced postharvest losses (African Union 2022). Uganda is also making progress in fully supporting social protection initiatives and in being better able to address any disasters and emergencies with food and nutrition security implications. Under the Malabo commitment to halve poverty through agriculture by 2025, Uganda is on track for several indicators, including an annual agricultural sector growth rate of at least 6 percent and at least 5 percent of youth being engaged in new job opportunities in the agriculture value chain. Other on-track indicators for some Malabo commitments include creating an enabling environment for trade and increasing the share of agricultural land under sustainable land and water management, including climate-smart agriculture practices. Uganda is progressing well towards achieving the Malabo Declaration commitments (African Union 2022).

The country has also made progress towards broader economic development. Some indicators of this include improvements between 2000 and



2021 in GDP per capita from USD 258 to USD 964, in life expectancy from 48 to 63 years, in the share of the population with access to electricity from 7 to 45 percent, and a rise in individuals using internet from zero to 10 percent (World Bank 2023a).

Uganda has also significantly reduced levels of unemployment among youth. The most recent National Labor Force Survey of 2021 showed the youth unemployment rate as 14.9 percent-12.8 for males and 17.5 percent for females (UBOS 2021). Uganda continues to strive to reduce youth unemployment by creating more quality and gainful jobs, by increasing access to quality education and training in science, technology, engineering, and math (STEM), through the provision of universal secondary education, and by making biology, chemistry, mathematics, and physics compulsory at the Lower Secondary level (NITI Aayog 2020, Namatende Sakwa and Longman 2013). Successes are being achieved-the percentage of youth that completed upper secondary rose from 36 percent in 2017 to 45 percent in 2021 (ILO 2023b). For the period 2020/21 to 2024/25 under the Third National Development Plan (NDP III), Uganda plans annually to create 100,000 jobs through agro-industrialization and 520,000 total jobs (NPA 2020).

This country case study provides an in-depth analysis of the institutional and policy innovations and programmatic interventions that have made a meaningful contribution towards youth employment and empowerment in Uganda's agrifood systems.

2. Institutional Innovations

Uganda has undertaken several institutional innovations aimed at economically empowering youth. This section focuses on institutions whose mandates align with youth empowerment in agrifood systems.

Ministry of Education and Sports (MoES). Youth education is critical for human resource development in agrifood systems. Uganda's MoES ensures the provision of quality education and sports services through four Directorates:

- Basic and Secondary Education,
- Higher, Technical, Vocational Education and Training,

- Education Standards, and
- Industrial Training.

The Ministry is not only mandated to ensure universal and equitable access to quality basic education for all children through Universal Primary Education (UPE), which was launched in 1997, but also to improve the quality of postprimary education by ensuring the attainment of targeted pass rates in Mathematics, English, Science, and Information Technology. MoES is also mandated to build capacity by supporting national education managers in acquiring and improving their knowledge, teaching skills, and attitudes to plan, monitor, account, and perform managerial functions within educational institutions (MoES 2019a).

Over the past 25 years, many more children have been completing primary school due to UPE. In consequence, the government launched Universal Secondary Education (USE) in 2007 to increase access to secondary education for the growing number of primary school graduates (O'Donoghue, et al. 2018). Uganda was the first country in sub-Saharan Africa to introduce both a Universal Post-Primary Education and Training (UPPET) program and a USE policy (Kakuba, et al. 2021). Students enrolled in government-aided schools or in low-fee private schools in selected areas with limited access to government-aided schools receive subsidies (NITI Aayog 2020).



Business, Technical, Vocational Education and Training (BTVET) institutions also provide the economy with qualified and competitive workers, enabling all Ugandans to participate in sustainable growth and poverty reduction (MoES 2023). Given that many young farmers face financial losses due to poor post-harvest handling, the TVET program under the MoES recently introduced a new program, "Agro-processing and post-harvest management" in the eight TVET institutions of Uganda and in one university. This hands-on training program targeting youth will be introduced in other training institutions in the second phase of its roll-out (Tsebeni and Owente 2022).

MoES operates several specialized institutions that ensure quality education for young people, including in STEM. These include the National Curriculum Development Centre and the National Council for Higher Education.



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National Curriculum Development Centre (NCDC).

NCDC is responsible for developing curricula at all levels of learning in Uganda's educational institutions-primary, secondary, and tertiary levels. It ensures that the curricula meet specific quality standards and are up-to-date, equitable, and relevant to the country's needs. The content of the curricula is determined through research, innovation, and stakeholder involvement. Some of NCDC's key priority areas include supporting increased youth access to STEM courses, the integration of ICT in learning, and remote learning methodologies (NCDC 2022). NCDC has two directorates: the Directorate of Curriculum and Instructional Materials Development and the Directorate of Research, Consultancy, and Library Services.

As part of its mandate, NCDC revised and rolled out a new competency-based curriculum at the lower secondary level in 2020 to better meet the needs of learners, especially enhancing their skills to meet emerging labor market demands (NCHE 2023). The needed skills include ICT, mathematical computing, critical thinking, creativity, collaboration and teamwork, communication, information literacy, and flexibility (Chemonges 2020, Agaba 2023). The new lower secondary curriculum requires the integration of ICT across the entire curriculum, enabling all students to develop digital skills. The new curriculum is being rolled out through a phased-out approach. To ensure effective teaching of the new content, 90 national facilitators, 1,600 master trainers, and 20,000 teachers of the first level in lower secondary (senior one) were trained in the new curriculum at 27 regional Teachers Training Centres across the country before its initial roll-out (NCDC 2020). The training targeted both government- and private-funded schools, with four or five teachers per school attending. Books for the new course were distributed by NCDC to 6,020 schools. Learner prototype books, teacher's guides, and training manuals were all made available online. In addition, NCDC disseminated the new lower secondary curriculum to a range of stakeholders, including the Parliament and universities. The curriculum framework, which consists of key learning outcomes, values, and generic skills and covers a range of cross-cutting issues, was printed and distributed to all schools.



National Council for Higher Education (NCHE). NCHE was founded by the government in 2001 to establish, manage, supervise, and guide institutions of higher learning in Uganda in creating and delivering guality education. NCHE conducts its duties through several committees, including the Committee on ICT, Research, and Innovation (NCHE 2023, Kasozi 2016). NCHE is the regulator of higher education and is responsible for implementing the Universities and Other Tertiary Institutions Act. NCHE ensures that the quality of higher education in private and government universities-including Makerere University, Gulu University, Kyambogo University, Busitema University, and Nkozi University, among others-by ensuring that these institutions of higher learning continuously improve their curricula so that their graduates are suited to handle current job demands. Through research and innovation, NCHE generates new knowledge to assist Uganda's universities in improving the quality and comprehensiveness of their students' education. In doing so, their graduates will be better able to meet any new or transformed needs in Uganda's labor markets, thereby contributing to the country's economic development.

Science, Technology, and Innovation Secretariat at the Office of the President (STI-OP). The Government of Uganda recognized quite early that prioritizing science, technology, and innovation (STI) is a crucial driver for economic growth. In consequence, it established the Ministry of Science, Technology and Innovation in 2016. The Ministry was originally mandated to offer overall guidance and coordination for scientific research and the development of Uganda's National Innovation System. To give it more relevancy, it later was transferred to the Office of the President and renamed the Science, Technology, and Innovation Secretariat at the Office of the President (STI-OP), led by the Minister of STI.

The STI Secretariat provides leadership, an enabling environment, and resources for scientific research and knowledge-based development for industrialization, competitiveness, and employment creation, leading to a sustainable economy (STI Secretariat 2023). The Secretariat formulates policies, plans, and programs related to STI, determines national priorities in STI, coordinates, implements and evaluates STI

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programs, monitors public and private sectors' utilization of STI for development and supports private-public partnerships for investments in STI. The Secretariat executes its mission through the Uganda Industrial Research Institute, Uganda National Council for Science and Technology, the Banana Industrial Research and Development Centre (formerly known as the Presidential Initiative on Banana Industrial Development), and Kiira Motors Corporation (STI Secretariat 2023, Nakandi 2023).

Uganda Industrial Research Institute (UIRI). Established in 2002, UIRI's core activities focus on "establishing platforms for value addition; food product development; process design; sourcing technologies; fabrication of machinery; managing processing plants; provision of SME outreach services: and business incubation (UIRI 2023)". The Institute offers platforms for innovation and the application of science and technology, which supports the development of technologies for industrial growth in Uganda. UIRI also conducts research for value-addition that will result in the development of competitive and marketable products created from local raw materials and will promote the commercialization of these research and development efforts. Hence, the institute links academia and other researchers with the government and the private sector.

UIRI's Business Incubation Centre nurtures startup businesses by providing equipment and facilities-including physical space, laboratory services, skills training, marketing services, and other business services-from which young people and other entrepreneurs can benefit. Among the skills training offered are meat processing, dairy processing, fruit and vegetable processing, mushroom cultivation and processing, and baking. The business incubation program begins with an open call under which enterprises can submit their business proposals to UIRI. The businesses selected then receive the necessary training in their respective areas of interest before applying to be accepted for incubation. The incubation period at the institute takes up to two years. UIRI has successfully incubated several start-ups that have benefited from its services. Among the notable start-ups benefitting from UIRI's Business Incubation Centre are Mega Milk, the Lira peanut processing plant, Amagara Skincare, and the Mushroom Training and Resource Center (UIRI 2023, Kamalinda 2018).



Uganda National Council for Science and Technology (UNCST). UNCST was established in 1990 as a semi-autonomous government agency. It operates under the Science, Technology and Innovation Secretariat of the Office of the President (STI-OP). It is mandated to advise the government on policy issues to promote science and technology in Uganda, to develop and implement policies and strategies to integrate science and technology into national development policies, and to coordinate and guide research and development efforts in Uganda (UNCST 2023). As of 2021, UNCST's strategic direction included regulating all aspects of STI, translating STI policies into regulations and standards that can effectively guide the operations of all STI activities in Uganda, and monitoring and evaluating STI efforts. UNCST also supports professional science and technology institutions in creating an innovative and enabling environment for their scientists. This includes providing continuing professional development opportunities in the sector (Ongol 2022).

UNCST recognizes that frontier technologies are converging to produce new combinations of disparate technologies, resulting in the growth of various sectors–for instance, satellite and drone mapping can be used to develop effective, efficient, and sustainable irrigation, fertilizer, and pesticide systems through employing precision agriculture techniques in Uganda (Ongol 2022). By utilizing science, technology, and innovation in various sectors, including agriculture, such efforts will contribute to Uganda achieving its aim of transforming from a peasant nation to a modern and prosperous one by 2040.

As one example of such efforts, the Government of Uganda, through UNCST, is implementing the National Science, Technology, Engineering, and Innovation Skills Enhancement Project (NSTEI-SEP) to enhance the technological and skill capacity of Ugandans. The project has three componentsthe National Institute of Technopreneurship in Kiruhura district, the Technology Innovation and Business Incubation Centre in Mukono district, and the NSTEI Technical Service Company offering construction machinery and other equipment for rent. The project aims to re-tool graduates, artisans, technicians, and engineers by equipping them to undertake various infrastructural works and enhance their technological and skill base. This upskilling aligns with the objectives of the Third National Development Plan (NDP III). Annually,

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approximately 1,500 trainees, mostly youth, will undergo competitive selection to participate in training under nine technology areas–agricultural mechanization, automotive technology, metallurgy (welding and fabrication), industrial and mechanical technology, construction machinery technology, civil engineering technology, electronic and electrical research and development, finished leather products processing technology, and textile design technology. The project is expected to create over 12,000 direct and indirect jobs (Amawulire 2022, UNCST 2021).

Banana Industrial Research and Development Centre (BIRDC). Formerly the Presidential Initiative on Banana Industrial Development, BIRDC was established in 2005. It aims to support rural farmers with access to science-led banana processing and value-addition enterprises for increased income generation through rural technology business incubators and industrial technology park models. The Center focuses on adding value to bananas, giving numerous job opportunities to youth as processors, distributors, and retailers. For example, BIRDC commissioned a distribution program, dubbed Tuku Tuku, as it centered on three-wheeled motorcycles, which has employed many youths from the on-farm production of bananas to their processing, marketing and distribution. Moreover, BIRDC has a 24acre banana plantation that is used to train farmers on improved banana production and processing methods (Nakandi 2023, Samilu 2023, BIRDC 2021).

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). MAAIF is the ministry responsible for increasing Uganda's agricultural production, food security, farmers' income, and exports of food produce. This Ministry oversees, formulates, reviews, and implements policies and enforces regulations and laws across agrifood value chains. Additionally, MAAIF is mandated to regulate the use of farm inputs, strengthen human and institutional capacity, mobilize resources for the effective delivery of agricultural services, and develop and promote national, regional, and international collaboration in the agriculture sector (GoU 2023).

MAAIF has four Directorates:

- Animal Resources,
- Crop Resources,
- Fisheries Resources, and
- Agricultural Extension Services.

The Ministry executes its mission through several affiliated agencies:

- the National Agricultural Advisory Services,
- the National Agricultural Research Organisation,
- the Diary Development Authority,
- the National Animal Genetic Resource Centre and Data Bank,







• the Coordinating Office for the Control of Trypanosomiasis in Uganda,

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- the Uganda Coffee Development Authority, and
- the Cotton Development Organization.

Here we discuss three of these-those for agricultural advisory services, agricultural research, and dairy development:

National Agricultural Advisory Services (NAADS). NAADS is a semi-autonomous body established in 2001 by the NAADS Act to increase agricultural productivity by ensuring efficient and effective delivery of agricultural advisory services. NAADS aims to contribute to increased commercialization and competitiveness of Uganda's agricultural production and agro-processing or other valueaddition for improved food security and household incomes. To achieve this goal, NAADS seeks to increase access by farmers to critical knowledge and quality inputs, to improve postharvest handling and storage, to increase agro-processing and other value-addition efforts, and to improve service delivery through strengthened coordination (NAADS 2020a).

To increase household incomes and export earnings, NAADS has developed interventions aimed at increasing production and productivity levels for several priority agricultural commodities. This is done through procurement and distribution of planting materials to farmers in various districts. The strategic crops include tea, citrus, mango, pineapple, apple, and cocoa. The interventions target socio-economically also vulnerable categories, particularly youth, women, persons with disabilities, and older persons, who receive planting materials for other income-generating crops, including passion fruit, ginger, grape, onion, garlic, and mushroom (NAADS 2020b).

In 2022, NAADS trained 540 youth leaders in agriculture across the country in dairy farming, agricultural business management techniques, and cultivating a business mindset. The training included a hands-on experience on the farm to understand the different breeds of dairy cattle and what feed and treatments the animals require. Overall, the youth training aimed to enhance household food security and income for the youth leaders and improve their livelihoods, while also contributing to agricultural sector development. After the training, each trainee received a dairy heifer. Given the multiplier effect of the heifers, the youth were encouraged to demonstrate to their peers how to generate income from farming as a business (NAADS 2022).

National Agricultural Research Organization (NARO). NARO was established as a corporate body by the National Agricultural Research Act of 2005. NARO comprises a Secretariat, a Governing Council, and 16 Public Agricultural Research Institutes spread across the country. Its mission is to innovate for sustainable agricultural transformation. NARO is mandated to coordinate and oversee all aspects of public-funded agricultural research in Uganda, including on crops, livestock, fisheries, forestry, agro-machinery, natural resources, and socio-economics (NARO 2023a).

NARO aims to increase total factor productivity and access to agricultural research products and services for inclusive agricultural growth across Uganda. NARO's strategy involves attracting youth to agriculture. NARO has designed a youth empowerment action plan which operates starting from the primary school level to the university level. The youth empowerment action plan includes activities such as an annual youth writing competition in agriculture and setting agriculture questions for testing at all educational levels (NARO 2023b).

NARO also provides training and up-skilling of youth in selected enterprises like horticulture, rabbit production, and piggery enterprises. These are all aimed at enabling young people to become successful agricultural entrepreneurs. NARO set up a youth incubation hub at the Mukono Zonal Agricultural Research and Development Institute (ZARDI), which serves to incubate young people's ideas into products out of which the youth can create industries. Some youth from the incubation hub have set up processing industries that make use of groundnut, avocado seed, cassava, and sweet potato. NARO is also supporting youth in agriculture by reducing the drudgery of many agricultural tasks through agro-mechanization. Because of the technologies developed by NARO, such as shellers for maize and groundnut or rice threshers, the time taken to shell or thresh these crops is much shorter than if done by hand, attracting more youth to agriculture (NARO 2023b).

NARO recognizes that youth and women need to catch up in accessing improved agricultural technologies and extension services. In mid-

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2023, the organization launched the NARO Youth Empowerment project, a three-year intervention spearheaded by Mukono ZARDI. The project is working to enhance the uptake of NARO technologies among youths, particularly technologies for chicken, vegetable, and pig production. The project is also being implemented in the Bunyoro sub-region, where Bulindi ZARDI implements it. In partnership with Gudie Leisure Farm, the project has established Village Entrepreneurship and Learning Associations and farmer service centers to accelerate youth adoption of the target technologies.

Dairy Development Authority (DDA). A semiautonomous agency established by the Dairy Industry Act of 1998 to develop and regulate the dairy industry in Uganda, DDA's mission is to increase the productivity and competitiveness of the dairy sector, enhancing its contribution to the health and wealth of all Ugandans. DDA is mandated to contribute to economic development and improved nutritional standards in Uganda by providing development and regulatory services that will ensure increased production and consumption of milk, as well as a sustainable and profitable dairy industry sector (DDA 2023).

To contribute to job creation among youth, DDA conducts formal training and skills development in the dairy sector. In 2018 and 2019, DDA trained almost 5,000 people country-wide, including 1,230 youth, in how to improve milk quality and increase dairy production and productivity for income generation (DDA 2019). The training topics included breeding technology, farm infrastructure, disease control, feed production, dry season feeding, hygienic milk production, dairy registration, milk testing, dairy regulation and standards, group formation, and management.

DDA also trains dairy stakeholders, most of whom are youth, in professionalization at downstream levels of the dairy value chains, such as in the production of yogurt, butter, ice cream, and other dairy products, as well as through providing training in product quality control and assurance. The Entebbe Dairy Training School coordinates this training. In 2018 and 2019, more than half of the over 500 trainees were youth. Trainees were followed up with after completing their course to ensure mentoring, continuity, and utilization of the skills they acquired to support job creation (DDA 2019, 2021). Food Technology and Business Incubation Center (FTBIC). Established in 2008, FTBIC has been financially supported since 2010 by the Government through the Presidential Initiative for Value Addition to equip the incubator with laboratories and processing lines (UNCTAD 2020, Makerere University 2014). FTBIC is housed at the School of Food Technology and Bioengineering of Makerere University. It is the first universitybased technology and business incubator in East and Central Africa. The center was established to develop new value-added food businesses, especially those reliant on local produce and using techniques emerging from research conducted at Makerere University. It also trains students in practical and entrepreneurial skills. Its mission is to nurture and sustain food and allied businesses, especially among women and young graduates, by providing innovative research, practical solutions, linkages, entrepreneurship development, and outreach. These efforts are to lead to wealth creation and nutrition enhancement (Makerere University 2014, Muyonga 2014).

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Young people-both students and fresh graduatescan benefit from FTBIC. The Center offers a platform for them to venture into entrepreneurship by providing access to processing facilities and technical support to boost their production, marketing, and business management capacity. The center offers various services, including processing infrastructure and space; enterprise, outreach, and skills development; research and food product development support; food analysis; and technical advice on quality management, processing, and packaging. Examples of the types of processing supported include meat, dairy, fruit and vegetable, extrusion processing, and baking. The center's mobile fruit and vegetable processing plant facilitates the processing of produce in fruit and vegetable producing communities across Uganda (Makerere University 2014, Muyonga 2014).

By 2015, the center had facilitated 20 food processing start-ups and with 41 new products has expanded the variety of domestic agro-based food products on the market. It has supported the creation of over 100 direct jobs in producing and marketing value-added foods and over 500 jobs for raw material suppliers (Muyonga 2014). In 2019, a new facility funded by the Presidential Initiative on Science and Technology allocated 1,200 m² of the total 7,000 m² new space to FTBIC. This doubled

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the space used by the center (Wamai 2019) and will enhance FTBIC's capacity to support more young people in agrifood businesses. However, a continuing challenge is the overall need for more support for scaling-up these new businesses once the start-ups emerge from the incubator. This challenge includes limited access to credit or affordable processing space to meet high market demands.

Consortium for enhancing University Responsiveness to Agribusiness Development (CURAD). An autonomous agribusiness incubator established in 2012 by Makerere University in partnership with the National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE) and NARO, CURAD is a public-private partnership initiative. It is one of the six agribusiness incubators in Africa started and supported by the African Union under the management of the Forum for Agricultural Research in Africa (FARA) (CURAD 2023a).

CURAD has three incubation centers (CURAD 2023b):

- Rural Agribusiness Incubation Hub-juice, water, and other beverage production and processing,
- Coffee Entrepreneurship Bureau of Uganda-coffee value-addition for both local and international export, and
- CURAD Agri-park–processing fruits and vegetable for export.

The incubator supports skilled and unskilled young students, graduates, farmers, farmer organizations, agricultural entrepreneurs, startups, and small and medium-sized enterprises to grow and develop their business ideas. Its focus is to generate innovative young entrepreneurs who can increase their incomes and create jobs for their peers in the agrifood sector. Over 420 youth startup enterprises have been supported technically and financially before they went on to become well-established businesses and created over 6,300 jobs. Close to 20,000 smallholder farmers generate income as raw materials suppliers to these agribusinesses (CURAD 2023c).

National ICT Innovation Hub. Uganda's National ICT hub was established in 2017 through the National ICT Initiatives Support Programme and is located at the Uganda Institute of Information and Communication Technology (MoICT & NG



2023a). The hub promotes digital solutions to local challenges in Uganda and aims to increase entrepreneurship and digital employment. It hosts 29 companies and runs seven programs–Data Ladies, Leap, MTN ACE, 3D Computer Animation, Founder's Institute Training, ICT Bootcamp, and EduTech (National ICT Innovation Hub 2022). Additionally, the National ICT Innovation Hub has initiatives that can be utilized by young people, including hub-spoke initiatives, digital skilling and training, infrastructure and shared services, mentorship, and business development and advisory services. The Hub has a target of within 1,000 days engaging with 1,000 start-ups facilitated by a network of 1,000 mentors.

Presidential Zonal Industrial Hubs. The Hubs were launched in 2022 in 12 districts. By the end of 2023, there were 20 regional industrial hubs (Karungi 2023, Nafula 2022). The industrial hubs' aims are to reduce youth unemployment rates due to their lack of skills and, hence, to help transition youth from being job seekers to being job creators. Enrolled youth undergo six months of training. Each hub is expected to enroll more than 300 jobless youth per semester to train them in farm management, baking, plumbing, electronics, welding, and similar skills.

The hubs also focus on value-addition for the best crops in their locations-those that would yield far more income if processed than if sold in their raw, unprocessed state. Youth are given access to the machinery in the hubs to transform raw materials into high-value products that they can sell to get more income. Some hubs also employ the four-acre model in which youth are trained in how to generate sustainable income streams off of small pieces of land using modern agricultural production and processing methods. From the initial 12 industrial zones, over 2,500 youth graduated in 2023 (Karungi 2023, Nafula 2022, Monitor 2023).

Youth Go Green. This youth-led umbrella organization was launched in 2014 by the President, with the Speaker of Parliament as its Patron. Its mission is to empower and engage young people to pursue low-carbon socio-economic development pathways. The membership of Youth Go Green consists of youth engaged in climate change, resilience, green growth, environment protection, SDGs, and youth empowerment activities in Uganda and other African countries. In Uganda, Youth Go Green operates in most districts

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to promote green jobs, environment conservation, and agriculture among youth. The organization has six thematic areas:

- Climate change adaptation and mitigation,
- Biodiversity conservation,
- Green growth,
- Energy transition,
- Innovation and advocacy, and
- Youth skilling and empowerment.

Some of the activities under the organization include launching the Go Green campaign in different regions and encouraging youth to join and sign pledges as ambassadors to grow trees (YGGU 2017).

In 2017, Youth Go Green organized the first African Conference of Youth on Climate Change and Its Linkages with the Sustainable Development Goals (SDG). The conference convened more than one thousand youth from across the continent in Uganda to discuss challenges, opportunities, and prospects for youth to advance solutions to climate change and biodiversity conservation and to achieve the SDGs. The youth organization has also received funding for the "Innovative Youth Engagement in Waste Management" project in Kampala and Gulu.

Youth Go Green has partnered with several government institutions to fulfill their mission.

For example, the organization partnered with the Parliament of Uganda to undertake climate change and forestry initiatives and with the Uganda National Roads Authority to plant indigenous and ornamental trees on road reserves. Most notably, its members have partnered with the National Forestry Authority to assist in the restoration of the degraded Central Forest Reserves and other degraded areas across Uganda–over 45 million trees of indigenous species and fruits have been planted country-wide.

To increase public awareness of climate change mitigation and adaptation measures and to expand waste recycling for charcoal briquette production, Youth Go Green launched Go Green clubs in primary and secondary schools and chapters in universities across Uganda. The organization also engaged local communities in various parts of the country, including youth, women, and other vulnerable groups, in distributing fruit and tree seedlings to schools and community tree growers and in campaigns to increase awareness on land restoration, biodiversity conservation, and climatesmart agriculture practices. Youth Go Green also conducted sensitization on environmental and climate change laws, policies, and strategies to enhance community resilience for improving food security and sustainable natural resources management (YGGU 2017).

3. Policy Innovations

Science Education Policy. The shortage of agricultural researchers, doctors, engineers,



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chemists, and other science-related professionals in Uganda prompted the formulation of the Science Education Policy in 2005. The policy made science subjects-biology, chemistry, mathematics, and physics-compulsory at OLevel. The Government further introduced incentives for students who pursued university-level science courses by allocating 75 percent of all Government scholarships (all tuition covered) towards sciencerelated studies at public universities and other tertiary institutions in Uganda (Namatende Sakwa and Longman 2013).

To support the policy and ensure effective teaching and learning of science subjects, the government, through MoES, provided science laboratory materials to over 1,340 underserved schools. Additionally, science textbooks were supplied to public secondary schools, and laboratories were constructed in various schools. To further facilitate quality teaching of sciences, the Secondary Science and Mathematics program was established to improve teaching (Rukundo and Bashaija 2022).

Technical Vocational Education and Training Policy

(TVET). The Government of Uganda appreciates that technical and vocational skills are vital in solving societal problems and, thus, contribute to economic transformation. TVET is the part of Uganda's education system that provides courses and training programs related to employment. TVET providers, such as agricultural colleges and universities, offer these. TVET provides young people with a transition from secondary education

to work. Upon studying technologies and related sciences, general education coursework, and knowledge, skills, and attitudes relevant to specific sectors, youth with this additional training can then offer their highly skilled labor within Uganda's labor markets (MoES 2019b).

The shortage of skills in the Business, Technical, Vocational Education and Training (BTVET) subsector led to the formulation of the Technical and Vocational Education and Training (TVET) policy in 2019. MoES developed the TVET policy under the Uganda Skills Development Project, which facilitated the review of the then current laws and the generation of an appropriate legal framework for how TVET might contribute to Uganda's socioeconomic transformation. Therefore, the policy provides a new direction for the delivery of TVET as it involves the review of related laws, such as the BTVET Act 2008; the Education (Pre-Primary and Post-Primary) Act, 2008; and the Universities and Other Tertiary Institutions Act, 2001 (MoES 2019b, 2020). The TVET policy provides a framework for training a highly skilled and competitive workforce. It addresses Uganda's skills shortage by ensuring the training of its youth with relevant skills for increased productivity, labor market efficiency, and technological readiness, instead of just providing training so that they can acquire educational certificates.

The TVET policy is expected to form a worldclass TVET system in Uganda that delivers highly skilled graduates who can effectively pursue



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employment and entrepreneurship opportunities and contribute to national development. This will involve efforts to promote TVET among young people by highlighting how the skills TVET provides will permit trainees to increase their productivity and incomes in formal, non-formal, and informal settings. In parallel, business incubation and innovation centers will be established in TVET institutions. Scholarships and other subsidies will be provided to trainees to ensure the affordability of TVET. Research and innovation efforts will be boosted in all TVET institutions, and TVET curricula will be reviewed and expanded based on occupational standards set by the established employer-led Sector Skills Councils. The policy encourages employers to offer hands-on training opportunities to TVET trainees through internships, apprenticeship centers, and industrial attachments (MoES 2019b).

Funding for the TVET system in Uganda comes both from the public budget and from private households through training fees. The policy proposed strategies for adequate and sustainable TVET financing, such as the establishment of a Skills Development Fund, increased government budget allocations to TVET institutions and activities, and a TVET Directorate in MoES to coordinate and implement employer-led TVET delivery (MoES 2019b, 2020, UNESCO 2021).

Uganda Vision 2040. To achieve socio-economic transformation for sustainable development and prosperity,theGovernmentofUgandaapprovedthe Comprehensive National Development Planning Framework in 2007. This framework outlines the principles and guidelines for developing national and decentralized development plans for a shared national development vision (NPA 2009).

Uganda Vision 2040 was developed to operationalize the vision statement "A transformed Ugandan society from a peasant to a modern and prosperous country within 30 years". The National Planning Authority managed its formulation. The vision is to be implemented through National Development Plans, Sector Investment Plans, and Annual Workplans and Budgets (NPA 2009).

Uganda Vision 2040 is conceptualized around strengthening the fundamentals of the Ugandan economy to harness the numerous growth opportunities in the country for various sectors, such as agriculture, ICT, industrialization, trade, and business (NPA 2013). Uganda identified



inadequate human resources as one of the major challenges to its economic development. Addressing this presents an opportunity for youth to support Uganda's economic development, while also reducing unemployment rates among young people. Thus, Vision 2040 emphasizes providing youth with globally competitive skills to attract foreign direct investment and good wages, especially in the science, technology, engineering, and information fields. These skills can be built through the efficient and effective implementation of National Development Plans.

National Development Plan III (NDP III). The National Development Plan (2020/21-2024/25) is the third in a series of six five-year National Development Plans to deliver Uganda's Vision 2040 (NPA 2020). Among the challenges grappled with in NDP III is the inadequate creation of quality and gainful jobs, especially for youth. Some of the achievements expected by the end of the five-year plan period include:

- Reduce the poverty headcount rate for Uganda from 21.4 to 18.5 percent,
- Reduce youth unemployment to 9.7 percent through the creation of 512,000 jobs annually,
- Reduce the share of households whose livelihoods mainly depend on subsistence agriculture from 69 to 55 percent, and
- Increase the annual growth rate of the agricultural sector from 3.8 to 7.0 percent and that of the industrial sector from 6.1 to 8.1 percent.

Other expected achievements of NDP III that provide opportunities for growth in business and youth employment across agrifood value chains include affordable electricity for all processing and manufacturing enterprises, increased access to electricity from 21 percent of households to 60 percent, and increased broadband services coverage from 41 to 90 percent of the population. NDP III expands on Vision 2040, with sector-specific targets for agro-industrialization, human capital development, digital transformation, innovation, and technology development and transfer.

National Youth Policy. Youth are vital human capital for technological innovation and economic development. However, most of Uganda's youth reside in rural areas, and their livelihoods mainly

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depend on agriculture. Youth face numerous challenges-poverty, unemployment, and diseases-partly due to a lack of opportunities to acquire the practical skills needed in the labor market and poor access to health and social services. These led to the need for new strategies to implement the Uganda National Youth Policy.

Uganda originally adopted a National Youth Policy in 2001, led by the Ministry of Gender, Labour and Social Development in consultation with youthfocused agencies, youth leaders, and young people themselves (MoGLSD 2001). The policy was formulated to improve the lives of Uganda's youth by unlocking their potential for sustainable wealth creation and development. Due to changing needs among youth, the National Youth Policy 2001 was revised into the National Youth Policy 2016, which more accurately considered the heterogeneous nature of Uganda's youth. To operationalize the 2016 policy, the National Youth Action Plan (NYAP) was developed in 2016 (MoGLSD 2016). NYAP focuses on strengthening youth programming for capacity building and increasing the quality and quantity of job opportunities to support youth gainful participation in Uganda's economic development.

Youth, who are primarily engaged in subsistence agriculture, may need more knowledge, skills, and tools to enable them to participate effectively in agribusiness. To address these bottlenecks, NYAP advocates for the mobilization and sensitization of youth to increase their engagement in incomegenerating agricultural opportunities along agrifood value chains and access to improved agricultural inputs, agricultural extension services, financial services, and markets. The action plan also promotes the establishment of youth farmers' cooperatives, agricultural development banks, and regional demonstration farms for enhanced youth skills enhancement. NYAP identified several priority action areas to effectively unlock youth potential for sustainable wealth creation and development. These include (MoGLSD 2016):

 Sustainable livelihoods, employment promotion, and enterprise development: Given an enabling environment by the government for stakeholders to engage in youth livelihood programs, the policy supports youth capacity building. Capacity should be built in youth through, for example, skills training in entrepreneurship, innovation, and marketing. Doing so would increase youth job creation and youthrun enterprise development. Additionally, NYAP advocates for new legislation to require businesses to employ set quotas of local youth and provide tax incentives for youth-led businesses. The government would facilitate financial support for youth enterprise programs by developing youthtailored credit products in existing financial institutions and establishing a youth-focused trust bank.

- Education, training, and capacity building: NYAP aims to increase youth's access to quality and relevant formal and informal education. It also promotes skills development through practical vocational training, internships, and apprenticeship schemes.
- Information and communication technology: Improve youth's skills for increased adoption of ICT to contribute to Uganda's socioeconomic development.
- Youth and health: The health of Uganda's youth is critical for productive human resource development. Therefore, NYAP advocates for youth-friendly health services, such as for sexual and reproductive health, incurable diseases, and STD/HIV prevention, care, and treatment.
- Youth civic involvement, participation, and governance to ensure increased youth representation and participation in critical decision-making positions.

National Strategy for Youth Employment in Agriculture (NSYEA). In 2017, the Government of Uganda formulated NSYEA to provide a strategic direction for economically empowering youth in Uganda's agricultural sector (MAAIF 2017). The vision of NSYEA is to economically empower Uganda's youth through gainful employment in agriculture. The strategy seeks to attract, support, and retain youth employed across agrifood value chains-from production to processing to marketing and retailing. Doing so would also result in increased agricultural productivity, reduced postharvest losses, and increased value addition in the country overall. NSYEA considers the economic needs of youth in agriculture broadly, but also targets specific interventions for youth aged between 14 and 17 years, especially, school dropouts who have not been well targeted under other government



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programs. One of the key tactical objectives of NSYEA and the Agro-Industrialization Programme of NDP III is supporting youth entrepreneurship through localized small-scale agrifood value chain development to boost agricultural production, productivity, and efficiency, to expand processing activities for value-addition, to create good-paying jobs, and to increase exports (NPA & MAAIF 2021).

NSYEA implementation follows five themes, all essential for fostering the gainful involvement of youths in the agrifood sector (MAAIF 2017). These are:

- Ensuring an enabling environment for youth employment in agriculture,
- Supporting youth-oriented agricultural extension,
- Improving youth education and learning,
- Supporting youth entrepreneurship, and
- Adaptation to and mitigation of agribusiness risk and uncertainties.

New government programs, such as the Parish Development Model (PDM) (MoLG 2022), are aligned with NSYEA. Specifically, two PDM pillars are congruent with NSYEA–agriculture value chain development, which supports the creation of employment opportunities at production, storage, processing, and marketing levels; and mindset change and cross-cutting issues, including gender and environment. PDM is focused on organizing development initiatives at the parish level, the second-lowest political-administrative unit in Uganda, comprising between five and ten villages. To ensure that PDM is relevant to the aspirations of youth in these villages, the parish secretary for youth affairs is a member of the seven person local committee–the Parish Development Committee– charged with implementing the PDM. PDM is designed to create wealth and employment opportunities, especially for youth, and to increase household incomes (MAAIF 2017, MoLG 2022).

4. Programmatic Interventions

Youth Livelihood Programme. The Government of Uganda launched YLP in 2014 in response to high youth unemployment and poverty. The program is implemented by the Ministry of Gender, Labor, and Social Development (MoGLSD), through the existing local government structures. The program aims to empower youth to harness their social and economic potential and increase self-employment opportunities and income levels. The program strives to provide youth with entrepreneurship, life, and marketable vocational skills, knowledge and information for a positive mindset change, tool kits, and financial support for self-employment and job creation (MoGLSD 2022). YLP has three components:

• Livelihood Support through which youth are provided assets for income-generating enterprises, such as dairy production, highvalue crops, poultry, piggery, aquaculture, animal traction, agro-forestry, postharvest handling, value addition, and trade. About 70 percent of YLP resources are dedicated to this component.





 Skills Development includes training in marketable livelihood skills for creating selfemployment opportunities, including agroprocessing, baking, and cooking, among others; and promoting innovation using ICT.

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• Institutional Support for project implementation, transparency, accountability, and anti-corruption oversight.

MoGLSD provides technical guidelines and supports capacity building, financing, and overall coordination for YLP as the local governments implement it. YLP currently funds skills development projects and income-generating activities initiated by youth groups in all 112 districts of Uganda with a budget of about USD 100 million for five years (MoGLSD 2022). One of the pillars of YLP is to leverage private resources for the program and reduce pressure on public resources. One way this is done is by revolving funds for youth groups to facilitate funding for more groups and better ensure their sustainability. This involves, in part, revolving funds that are used for soft loans granted on youth-friendly terms-such as, for example, no interest being charged if the loan is repaid within one year (MoGLSD 2019).

By the end of 2019, over 240,000 youth (46 percent female) had been supported through over 20,000 youth projects. About one-third of the projects involved the agriculture and agro-processing sectors (MoGLSD 2019). YLP has faced some challenges, such as low or untimely repayment of loans from youth groups and corruption by local government leaders (MoGLSD 2019, Makumbi 2018). However, lessons learned from these challenges have been incorporated into the current phase, which runs to 2023/24, including more effective and timely repayment plans and the applications of sanctions on or prosecution of corrupt leaders (MoGLSD 2019).

Presidential Youth Skilling Program. This program was launched in 2017 to empower underprivileged youth in Kampala by expanding their employable skills. The initiative initially targeted girls, but started to include boys in 2019. There are currently nine centers for program. Among the vocational skills offered are bakery and confectionery, mechanics, fabrication, electronics, carpentry, metal embroidery, shoe-making, and construction. The program consists of six months of training. Upon completion, the program trainees are given an exam. If successful, they are certified through the Directorate of Industrial Training. Over 35,000 students have been enrolled in the program since its inception. Many youths have obtained or created jobs based on the skills they acquired. Close to 17,000 beneficiaries graduated from the program in October 2023, a ceremony presided over by the President of Uganda, who pledged to further support the graduates with start-up capital (Chimp Reports 2023, UBC 2023).

National Science Week. The Government of Uganda annually conducts a National Science Week to celebrate science, technology, and innovation in commemorating World Science Day for Peace and Development held on 10 November (STI-OP 2023). Through the Uganda National Council of Science and Technology, the government annually holds the Uganda Science Innovators' Award during Science Week (GCIC 2021). The awards aim to inspire young innovators to activate and exploit their abilities to contribute to technological



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development in the country, as well as to celebrate the innovation efforts of Ugandans. The event focuses on exhibiting to Ugandans, especially the youth, the roles and benefits of science, technology, and innovation towards facilitating market expansion and wealth creation in Uganda. The competition attracts young people, including secondary school students, who exhibit their innovations in agriculture and in employing ICT tools. Youth also participate in discussions, poetic recitations, and quizzes to test their knowledge and abilities on scientific innovations.

As of 2021, the awards have been categorized under six themes–Agro-security, Pathogen economy, Engineering, Mobility, Beauty and apparel, and Digital economy. Two special awards have recently been added-the National Woman Innovator's Award and the Uganda Science Ambassador Award. Two winners are chosen for each award-one for individuals above 18 years of age and one for those under 18 years. The awards in Agro-security are given for innovations in agro-processing, agribusiness, soil conservation, agriculture technologies, food preservation, and safety applications with practical models, devices, or applications. Winners under the Agrosecurity theme have included the designers of a locally made milk processing machine, an electric tractor, and a new way of preserving a local green leaf sauce, malakwang. The competitions have increased interest and positive attitudes towards science among youth, as is evident in the time and professionalism the youth give in preparing to exhibit their innovations at the Science Week events (Mugalu 2010, Emorut 2023).

Youth Empowerment Through Agriculture (YETA).

Running from 2015 to 2020, the YETA project was part of the Mastercard Foundation's Youth Forward Initiative that was implemented in collaboration with GOAL, the Overseas Development Institute, Solidaridad, Global Communities, and the National Cooperative Business Association CLUSA International (NCBA CLUSA). The YETA Consortium worked with various producer organizations and youth associations to reach out to unemployed, underemployed, at risk, or out of school youth to provide them with training, mentorship, and job opportunities (NCBA CLUSA 2021). The project enrolled youth from four districts in northern Uganda-Kole, Kiryandongo, Dokolo, and Masindi. YETA trained youth in numeracy, literacy, and general life skills. Specific technical skills



training was provided in agriculture, business, entrepreneurship, and management. All trainees received information on sexual reproductive health. Over 21,000 youth were trained in agribusiness skills and over 26,000 youth businesses were established. YETA showed that such initiatives can significantly empower youth in Uganda's agrifood sector and reduce youth unemployment.

Stimulating Agriculture for Youth Employment (SAYE). A partnership between Heifer International and the Mastercard Foundation, the SAYE project was launched in 2023 to create 33,000 new jobs for over 250,000 young people over six years (Heifer International 2023). The project targets youth in 11 districts of the Busoga sub-region in Uganda-Jinja, Mayuge, Iganga, Kamuli, Kaliro, Namutumba, Bugweri, Luka, Buyende, Bugiri, and Namayingo districts-who are involved in agriculture. The project aims to transform the region's agricultural market system by including more young people in decent employment within agricultural value chains. The project will establish youth-led agribusiness hubs, while local project partners will support the youth in improving their access to financial support and skills training, such as ICT and climate-smart agriculture solutions, among others. The project plans to reach 4.3 million Uganda youth beneficiaries, especially young women, by 2030, providing them with the skills and resources necessary to generate income through decent and sustainable employment across agrifood value chains.

Uganda Skills Development Project, 2016-2020 (USDP). Through the Ministry of Education and Sports, the Government of Uganda initiated USDP to boost the Business, Technical, Vocational Education and Training (BTVET) sector, given its potential to reduce youth unemployment and provide the largest number of skilled people to contribute to Uganda's economic development (MoES 2019c). Before the project's initiation, the BTVET sector faced challenges that included limited relevance to economic growth, low quality of skills trained, and limited access to training. The project started in October 2016 and was implemented by the Private Sector Foundation Uganda. It focused on training programs to support the development of important skills in the key priority sectors of agriculture, including agroprocessing, and manufacturing and construction, as stipulated in Vision 2040.

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To advance the quality of TVET delivery in Uganda, four colleges were transformed into centers of excellence through new partnerships established under USDP with recognized international TVET providers. For example, Bukalasa Agricultural College partnered with Dalhousie University of Canada to offer competence-based training in agricultural trades. As of 2019, 71 new internationally accredited technical and vocational courses had been developed across the 16 TVET Institutions facilitated by USDP. The students underwent high-guality competency-based training, with 70 percent of the training involving practical lessons to gain experience and skills using the same equipment used by industry. The remaining 30 percent of the training focused on theoretical lessons. With funding from USDP, Bukalasa Agricultural College underwent a complete revamp. This included the installation of a state-of-the-art library, layer, broiler, and pullet barns, piggery and zero grazing units, a feed mill, a milk processing house, a toilet and laundry structure, and a generator house. By the end of the project, over 82,000 beneficiaries had enrolled in the BTVET programs, surpassing the project's target by almost three-fold (MoES 2019b, MoES 2020). Many of the program graduates went on to get employed or start businesses. More than 1,600 jobs were created, and the project awarded 885 grants worth USD 17.8 million to small, medium, and large companies (PSFU 2022, MoES 2019c).

Other key achievements from the USDP project include the development and approval of the TVET policy, the development of 25 competencybased curricula, the establishment of Sector Skills Councils in the agriculture, manufacturing, and construction sectors, the creation of a TVET Management Information System, and the seating of a national TVET council. Following the project's success, the sector-specific approach is being scaled up to meet the skills demands of the growing Ugandan economy. A commitment has been made that 46 percent of the MoES budget will be directed to skills delivery through TVET, effective from FY 2021/22 (MoES 2019c).

Agro-industrialization Programme (2020/21-2024/25). This program is one of the critical priorities for improving the livelihoods of Ugandans, as stipulated in NDP III (NPA & MAAIF 2021). It aims to increase the agricultural sector's growth rate from 3.8 to 6.0 percent through increased agricultural production and greater commercialization of



The program has several targets (NPA 2020, NPA & MAAIF 2021):

- Increase the agricultural sector growth rate from 3.8 percent to 6.0 percent,
- Create more that 100,000 jobs along agroindustrial value chains,
- Improve labor productivity in the agricultural sector from USD 2,200 to USD 3,100 per worker per year.
- Improve household food security so that 90 percent of Ugandans have consistent access to the food they require,
- Reduce the share of households dependent on subsistence agriculture for their primary source of livelihood from 69 percent to 55 percent,
- Reduce post-harvest losses for priority commodities from 37 to 15 percent,
- Increase the export value of processed agricultural commodities almost three-fold from USD 0.9 billion to USD 2.7 billion, and
- Cut almost by half to USD 500 million per year the value of imports of imported cereals and cereal preparations, vegetable fats and oils, and sugar.

The Agro-industrialization Programme interventions include:

- Strengthening agricultural research and development,
- Increasing access to and the affordability and usage of fertilizers and agricultural machines,





• Increasing the establishment and coverage of irrigation systems,

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- Expanding storage, processing, and postharvest handling infrastructure, such as silos, warehouses, cold rooms, and dryers, and
- Increasing agricultural market access, especially for youth, women, and persons with disabilities.

The program targets 4,000 farmer cooperatives with youth and women membership to receive smallscale on-farm equipment for storage, processing, and value-addition. Dairy farm equipment and training in its use will be provided to 250 youth and women farmer cooperative societies. Training in business management, value addition, and meeting agricultural product quality standards will be provided to 40,000 beneficiaries. The program will also provide incentives to financial institutions to increase their lending to farmers, especially to women and youth, and to invest in the scaling-up of agribusiness incubation and accelerator programs. To ensure that what youth are taught in BTVET institutions is adopted and utilized by farmers, the training institutions will be incorporated into the agricultural extension system. The program also focuses on developing and equipping youth with knowledge, skills, and facilities for accessing and using modern extension services, as well as empowering youth to use ICT in developing agroenterprise innovations (NPA & MAAIF 2021).

The program supports the establishment of several regional agro-processing factories-two new vegetable oil mills, eleven fruit processing and beverage factories, four meat processing plants, four fish processing factories, and a cocoa processing plant. To increase market access and competitiveness, the program seeks to train farmers and manufacturers on sanitary and phytosanitary standards, digitize agricultural market information, and provide incentives to acquire refrigerated trucks and to construct warehouses at border points and fish landing sites, for example.

The program will increase the adoption of ICT in the agro-food sector by establishing nine climatesmart technology demonstration and multiplication centers at all the ZARDIs and BTVET institutions for technology dissemination and commercialization, with a specific focus on ICT adoption by youth. Additionally, access to agricultural extension services will be enhanced by scaling up innovative extension models, such as nucleus farmers (NPA & MAAIF 2021).

5. Conclusion

Uganda has registered successes in some economic and social sectors, such as agriculture and education, and has strategies to address areas where improvements are needed. The Government of Uganda recognizes the potential of ICT to accelerate development, create jobs for youth and other workers, and increase productivity. Hence, it launched the Education Digital Agenda Strategy 2021 to 2025 through MoES. This will help to improve Uganda's education service delivery through sustainable digital transformation (MoES 2021a, 2021b). To further support digital transformation, the government launched the Digital Skills Acceleration Program 2023/24-2025/26 (MoICT & NG 2023b) and the Digital Transformation program under NDP III, both of which aim to increase access and usage of ICT by vulnerable groups, including small-scale farmers (NPA 2020, NPA & MAAIF 2021). Under the Agro-industrialization Programme in the NDP III, more jobs are expected to be created along agro-industrial value chains, resulting in improved household food security overall (MoES 2023). Uganda's strategy to increase access to ICT education, infrastructure, and technologies, and to agricultural training and skills will further enable youth to obtain and create jobs in agrifood systems.

Youth in Uganda recognize the government's efforts to include young people in the agricultural sector. This is seen in NDP III, which plans numerous opportunities for job creation in the sector. To further accelerate the government's initiatives, recommendations to attract more youth to the sector are outlined in the National Youth Manifesto 2021-2026 (YCED 2020). The recommendations include increased investments in agribusiness centers nationwide to increase young people's access to modern equipment, technologies, and advisory services; promotion of youth-led cooperatives for increased access to credit by young people; and improved access to information by youth through agribusiness hubs for increasing their marketable skills.

1. Introduction

In the past ten years, Zambia's population has grown by about 3 percent yearly, higher than the average population growth rate in sub-Saharan Africa. In 2022, Zambia's Census of Population and Housing estimated its population at 19.6 million, with 49 percent male and 51 percent female (ZamStats 2022). Youth constitute the largest portion of Zambia's population-65 percent of the population is under the age of 25 years, and 52 percent is under 18 (Population Council and UNFPA 2019). The prevalence of youth in the population is attributed to the country's high population growth rate-the high youth population results from the country's diverse demographics (MOA 2023). Youth, who are defined as those aged 15 to 35 years of age, comprise 64 percent of Zambia's workingage population (all aged 15 years and above) and 56 percent of Zambia's labor force (ages 15 years and above who are employed or are unemployed but actively seeking work) (Bhorat, et al. 2015). Although Zambia still faces some challenges, such as limited resources in its education sector, it has made significant progress in expanding education access-primary school enrollment has increased to 82 percent, and 58 percent of the population has completed secondary education (OYA 2022).

Outside of the COVID19 pandemic period, Zambia has experienced consistent economic growth of around 6 percent per year since 2000 (World Bank 2023a). Agriculture makes up approximately 20 percent of the country's GDP and has the potential to be a significant contributor to economic growth due to the country's significant fertile land area and favorable rainfall (IFAD 2023). Most people in Zambia rely on agriculture for at least part of their income (Andersson Djurfeldt, et al. 2019). Farming accounts for over 20 percent of Zambia's formal employment and over 50 percent of the population's livelihood. Between 2017 and 2021, Zambia's Agricultural Production Index per capita (2014-2016 = 100) averaged 106.0 (FAO 2023a). The country's Enabling Business for Agriculture score in 2019 was 63.7-ranking Zambia second only to Morocco among the African countries surveyed (World Bank 2019c).

The agriculture sector offers a pathway for rural development and diversified national socioeconomic transformation (MOA 2023). There has been a decrease in youth participation in Zambian agriculture from 56 percent in 2012 to 22 percent in 2019, primarily due to their perception of



agricultural work involving intensive labor for relatively low income. Nonetheless, youth and women are increasingly involved in agricultural value chains, including in primary production, agroprocessing, trading, and retailing. In Zambia, most young people rely on agribusiness as their primary source of income, with 69 percent involved in the sector. Off-farm work is the second most popular livelihood activity for youth. Crop production is the most common type of agribusiness, involving 99 percent of respondents in Zambia (Mulema, et al. 2021). Many youth already process primary agricultural produce into products like meal, chips, and starch from cassava, peanut butter, and cooking oil from sunflower and soybeans. Often, this involves drying crops using simple technologies, like solar dryers, and then supplying the products obtained to markets and stores to generate income.

Zambia is committed to empowering its young people by signing and ratifying international agreements and implementing national laws and policies relevant to their economic wellbeing. These measures aim to support youth development by ensuring their human rights, promoting their participation in the economy and government, providing access to education, protecting them from hazardous work, improving their access to healthcare, and offering them financial support to undertake entrepreneurial activities (Population Council and UNFPA 2019). To create opportunities for youth, the government of Zambia aims to build a favorable environment for economic growth through privatization and good macroeconomic policies. In addition, dedicated efforts are being made to develop institutions and devise policies and programs to provide employment opportunities for young people in both the formal and informal sectors of the Zambian economy. This is being done principally by ensuring that youth obtain employable skills through appropriate higher education, technical education, and vocational training programs.

This case study provides a narrative review of the major institutional and policy innovations and programmatic interventions taken by the Government of Zambia and its partners to increase youth participation in the Zambian economy by offering them decent employment in the country's agrifood systems.

2. Institutional Innovations

The rising concerns and needs of the youth of Zambia have attracted the interest of the government in establishing an institutional architecture to channel their voices in guiding the design and implementation of government policies aimed at empowering them. Hence, the government of Zambia seeks to promote the increased participation of youth in agricultural education, providing them with management and marketing skills, including in agriculture, promoting their adoption of sustainable agricultural technologies, encouraging their engagement in food processing activities, and providing them with market information. To achieve this, the government plans to simplify land acquisition requirements for youth, acquire additional land for youth resettlement, provide them with agricultural implements and inputs, expand their access to microfinancing, offer financial grants for youth agricultural projects, offer them dedicated agricultural extension and technical services, and reintroduce young farmers' clubs in schools. These efforts aim to reduce youth unemployment in Zambia by sharply increasing youth engagement in agriculture and expanding youth-run agro-based processing businesses.

Ministry of Agriculture (MOA). MOA manages the government's agricultural activities to support the development of a sustainable and diversified agricultural sector, resulting in food and nutrition security and increased income generation (MOA 2022a). The Zambian government has recognized agricultural entrepreneurship as a potential source of youth employment (Kabwe,



Machina and Kinkese 2018). MOA aims to create a smart and value-centered environment for agricultural development, encouraging innovative production and productivity improvements. The Ministry also aims to foster a sustainable and diversified agricultural sector for increased income generation and food and nutrition security. This is to be achieved through cost-effective strategies, efficiency improvements, agricultural and dietary diversification, infrastructure improvements, and strengthening regulatory frameworks (MOA 2022a).

In addition to its ten departments, MOA runs seven training institutions through which youth can obtain specialized training in the agricultural sector. The institutions provide training in various topics, including horticulture, marketing, and cash production, and include:

- Katete College of Agricultural Marketing,
- Zambia Centre for Horticultural Training-Chapula,
- Zambia College of Agriculture–Monze,
- Zambia College of Agriculture–Mpika,
- Natural Resources Development College,
- Popota Tobacco Training College, and
- Zambia College of Agriculture–Mpongwe (MOA 2022b).



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The Government of Zambia, through MOA, has also established institutions jointly with development partners. For example, the Zambian-German Agricultural Knowledge and Training Centre (AKTC) was established with Germany's Federal Ministry of Food and Agriculture to provide handson training in farming, including to youth and beginner-level farmers. By 2023, AKTC had trained over 18,000 beneficiaries, including youth. AKTC is currently registered by Zambia's Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) as a training institute and has established the only tractor-driving school in Zambia (GOPA AFC 2023). Since 2017, AKTC has organized an annual Youth Day to highlight the economic opportunities and innovative technologies employed in agricultural value chains to young people in Zambia (GOPA AFC 2017).

Ministry of Small and Medium Enterprises Development. The Ministry was created in September 2021 to promote the development and growth of cooperatives and small and medium enterprises (SME) to create jobs and wealth across the country (MSME 2023). The Ministry plays a pivotal role in developing and supporting youth initiatives in Zambia, especially in the agrifood sector. Recognizing the critical importance of agriculture to the nation's economy and the potential for SMEs to drive growth and employment in agrifood systems, the Ministry has implemented various strategies and programs to foster entrepreneurship and provide opportunities for youth in these systems.

These initiatives typically include:

- Access to financial services and credit for young entrepreneurs who wish to start or scale their agrifood businesses.
- Training and capacity building to equip youth with the necessary skills and knowledge in agriculture, business management, and value chain development.
- Strengthening market linkages by creating platforms for young agrifood entrepreneurs to connect with markets, both locally and internationally, to ensure that they can sell their products and services effectively.
- Encouraging the adoption of new technologies and innovative practices in agriculture to increase productivity, sustainability, and competitiveness.
- Advocating for policies that support youth involvement in agrifood SMEs, such as tax incentives, subsidies, or prioritizing youth-led enterprises in government procurement.





• Establishing business incubators and mentorship programs that support young agricultural entrepreneurs to develop viable business plans and navigate the challenges of the agrifood sector.

By focusing on these areas, the Ministry of Small and Medium Enterprises Development ensures that young people are provided with opportunities and empowered to take advantage of these opportunities to create successful businesses within Zambia's agrifood systems. This approach contributes significantly to job creation, food security, and overall economic diversification in Zambia.

Ministry of Youth, Sport, and Arts (MYSA). MYSA is responsible for developing and implementing programs to help young people reach their full potential and improve their physical and mental well-being. The Ministry promotes child development, empowers youth, supports sports champions, and encourages healthy citizens. MYSA also aims to enhance youth economic empowerment programs, coordinate and promote sports programs, develop the arts industry, manage financial resources in these sectors effectively, improve its operational systems, enhance human resources and work culture, and improve infrastructure and equipment. The Ministry supports youth entrepreneurship by creating youth policies and fostering the development of youth skills. MYSA achieves its objectives through its five departments-Human Resource and Administration, Finance, Sports Development, Arts, and Youth Development (MYSA 2021b).

The Ministry conducts youth development programs at 23 Youth Resource Centres nationwide. These provide numerous training courses for youth, such as in food production and nutrition, general agriculture, entrepreneurship, computer and information and communication technologies (ICT) studies, and automotive mechanics, among others. Some agriculture-focused Youth Resource Centres, such as at Kwilimuna, were established by government between 2000 and 2011 with support from the Ndola Youth Resource Centre (NYRC), a youth-led and youth-focused Zambian non-governmental organization. NYRC's objective is to raise awareness of ICT-related skills among youth so that they can integrate those innovative skills into their work across various sectors, including agriculture. NYRC partners with Provincial Youth Development

Offices to coordinate and implement various youth development programs. Equipped with computers, printers, and communication tools, these centers facilitate information sharing among young farmers, linking them to key agricultural services and supporting them in accessing credit through the Youth Development Fund (FAO, CTA, and IFAD 2014, Chanda 2012).

In 2021 and 2022, the Ministry empowered almost 120,000 youths, among whom almost 2,000 completed their training in a range of skills (MYSA 2021a, 2021c). In 2023, the Ministry partnered with India's Jain University to sponsor 500,000 students in online skills training programs. The training is being conducted in batches of 50,000 students at the Ministry's Youth Resource Centers. Jain University provides internet access, laptops, and solar equipment to enhance the online training experience for participating youth (MYSA 2023a).

National Youth Development Council (NYDC). NYDC is an institution of the Zambian government responsible for increasing the involvement of young people in the country's social and economic development. Parliament established it to empower young people through effectively guiding the implementation of the National Youth Policy-the NYDC Act was passed in 1986 (NYCA 2005). The Council advises the government on youth-related programs, coordinates youth activities, implements programs, and supports other organizations in creating youth training and development initiatives. NYDC is also responsible for registering all youth-focused organizations in Zambia. It also offers opportunities for registered organizations to obtain funding (YouthLead 2021). NYDC additionally aims to assist young people in achieving their goals and aspirations by connecting them with opportunities to advance in life. It ensures that youth-led organizations, such as clubs, cooperatives, and associations, are equipped with the skills they need to operate effectively. The benefits of organizations registering with NYDC include legal recognition, compliance with Zambian laws, training in entrepreneurship and skills, access to mentorship and sponsorship, participation in meetings and conferences, and support in youth development.

Youth Development Organization (YDO). YDO was established in 1997 to plan, collaborate, and implement joint advocacy activities related to youth development in Zambia. The aim was to
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ensure that the government, cooperating partners, civil society organizations, communities, and other stakeholders, such as the private sector, collaboratively initiate and implement activities that contribute to a national approach to youth empowerment and, thereby, create a conducive environment for youth development in Zambia. The revised strategic plan for YDO is crucial in this context, being based on input and feedback from an evaluation of YDO's past performance (YDO 2021a).

YDO has created 30 Economic Empowerment Clubs in rural areas around Choma town in the Southern Province. These clubs consist of between 15 and 20 youth who share a passion for improving their skills and becoming financially independent. Over the years, club members have collaborated to generate income for themselves and their families. YDO has offered resources, training, and assistance to the clubs. Not only have the clubs improved the economic situation of their members, but they have also provided a valuable support system for vulnerable youth in the Choma area. YDO plans to increase the number of clubs and expand its support to areas beyond Choma by 2025. Also, with assistance from Voluntary Services Overseas, YDO helped 100 women with local chicken farming and 30 young individuals with goat rearing in 2020. YDO aims to expand its agricultural program to include a broader range of farming and marketing activities, including adding value to agricultural produce (YDO 2021b).

In 2009, YDO initiated Kick-Start Courses for orphaned and vulnerable young people in Singani and Pangwe. These courses equip young people with carpentry skills and start-up resources to develop their own income-generating activities. The project helps these young people overcome their disadvantages and work themselves out of poverty. YDO uses an innovative and comprehensive approach to provide them with the necessary skills, start-up resources, and motivation to develop their own small businesses. The initiative reduces stigma and discrimination and establishes a structured system to support orphaned and vulnerable youth in the long term. The Kick-Start Programme has been proven to be sustainable and to meet immediate needs, as those targeted by the program in Singani and Pangwe often suffer from food shortages and starvation. By reducing stigma and discrimination for orphaned and vulnerable



young people, the program aims to bring about sustained development for its beneficiaries (YDO 2021b).

Provincial Youth Development Coordinating Departments. Zambia comprises ten provinces, each headed by a deputy minister. The provinces are each further divided into several districts (Central Province 2021). Under each provincial administration, the Youth Development Coordinating Department focuses on the wellbeing of young people aged between 15 and 35 years in the province. It manages programs that help young people start businesses in agriculture and transportation. These departments also run training centers that offer courses in various skills, such as information and communication technologies (ICT), electrical work, food production, tailoring, and carpentry (Central Province 2022).

To improve coordination, the government ensures that the various ministries and organizations involved in youth development work together without duplicating or weakening each other (DYD 1994). This initiative to improve the coordination of youth development services within Zambia's provinces includes agencies involved with commerce, trade, technical education, vocational training, general education, local government, community development, social services, small and village industries development, and nongovernmental organizations.

Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA). TEVETA was established under the Technical Education, Vocational, and Entrepreneurship Training Act No.13 of 1998 and TEVET (Amendment) Act No. 11 of 2005. Its functions include:

- Advising the Ministry of Science, Technology and Vocational Training on human resource development through technical education, vocational training, and entrepreneurship training,
- Regulating management boards,
- Providing technical consultancies and promoting technical capacity,
- Developing national curricula, setting minimum standards and qualifications, providing guidelines for institutional curriculum



development, approving examinations, conducting national examinations, charging fees and awarding certificates, guiding institutions in recruitment rules, approving curricula and standards, registering institutions, and canceling registrations, and

• Performing other tasks related to the Authority's functions (TEVETA Zambia 2024).

Under TEVETA, the Government of Zambia has made significant reforms to the national technical education and vocational training system to better meet the economy's needs. The effort started in 1994 when a task force was appointed to review government policy and recommend necessary changes. These reforms were necessary because the earlier policies, formulated in 1968, did not align with the country's emerging economic and demographic conditions. Despite some attempts to adapt to the changing environment, the training system was not adequately providing workers with the new skills demanded in the country's labor markets. In January 1995, the Task Force made recommendations, leading the government to enact the TEVET Act in 1998. This law established TEVETA as the body responsible for implementing the TEVET policy. The new policy is more comprehensive and aims to meet the changing demands of the labor market and socio-economic conditions.

TEVETA is governed by a Board of Directors appointed by the Minister according to the Technical Education, Vocational and Entrepreneurship Training (Amendment) Act No. 11 of 2005. The Board comprises representatives from various organizations and institutions involved in technical education, vocational training, and entrepreneurship. These include representatives from trade unions, chambers of commerce, universities, employers' organizations, small and medium business associations, research and development institutions, religious organizations, and government ministries (TEVETA Zambia 2022c). TEVETA is partly funded by resources collected via the skills development levy through the Skills Development Fund, managed by the Ministry of Higher Education (UNESCO 2022).

TEVETA's mandate is far broader than simply managing the levy-financed TEVET Fundit includes more than 20 different areas of responsibility (TEVETA Zambia 2024), including,



for example, direct training provision, regulation and standards, curriculum and assessment, certification, accreditation, labor market information, national TEVET coordination, and national policy development (MOHE 2017). By 2020, TEVETA had registered 295 institutions (TEVETA Zambia 2020). In 2021, 6,180 trainees were enrolled in various trades-focused courses, including 30 in agricultural mechanics, almost 500 in food production, and over 30 in poultry farming (TEVETA Zambia 2022c).

Musika–Making Agricultural Markets Work for Zambia. Musika is a non-profit organization in Zambia that aims to encourage private investment in the country's agricultural markets, particularly in the lower end of those markets. 'Musika' means 'market' in several local languages in Zambia. Musika was registered in 2010 and is owned by six Zambian agriculture-related institutions:

- Zambia National Farmers Union,
- Golden Valley Agricultural Research Trust,
- Grain Traders Association of Zambia,
- Indaba Agricultural Policy Research Institute,
- Zambia Seed Traders Association, and
- Bankers Association of Zambia.

Musika aims to reduce poverty by ensuring that agricultural markets benefit all stakeholders, especially the rural poor. Its strategy involves creating a supportive market environment that allows farmers to invest in their own production and use markets to improve their economic situation. This approach aligns with the Making Markets Work for the Poor (M4P) methodology, which focuses on stimulating change within market systems to involve poor individuals in economic development (Musika 2024a). Musika was formed as a follow-up to successful market development interventions under the USAID|PROFIT private sector development program, which ran in Zambia for over seven years. Musika started in November 2011 with funding from several donors. It focuses on the agriculture sector and rural Zambians, primarily through working with firms and associations in the market. The project does not directly engage with the rural poor. This design feature is to ensure sustainability and to minimize market disruptions.

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Musika's interventions in Zambia's smallholder markets have created numerous opportunities for youth to invest in agriculture as a business, enabling them to play a solid and equitable role in the development of the agricultural sector. The development approach involves creating a beneficial market environment that supports improved market access while ensuring that women and youth are key market participants. An improved market environment includes increased opportunities for value addition, access to extension services and finance, opportunities for technology transfer, forward pricing, assured offtake, supply contracts, and other market services.

With Musika's support, the private sector has invested USD 50 million in rural areas, resulting in increased economic activity at the community level. Between 2015 and 2019, over USD 36 million of additional income was accrued to the smallholder economv due to improved commercial relationships between smallholders and agribusinesses. Musika's private sector partners provide extension support, training, and product knowledge, allowing youth to learn and adopt better farm management practices. Additionally, these private sector partners offer flexible asset leasing and tillage and haulage service provision to support efficient and increased crop production among youth who lack machinery. Partners also provide improved access to solar irrigation and



small processing equipment, which enables youth to produce crops and process products throughout the year. Young people's engagement in low-cost agricultural enterprises, like vegetable gardening, fruit tree planting, and small livestock, leads to increased income generation and economically safeguards rural youth in Zambia against economic and climatic shocks (Musika 2024b).

3. Policy Innovations

Compelled by the growing youth population and their aspirations for a better future and access to opportunities, Zambia has initiated several policy reforms to ensure youth mainstreaming in public investments and programming in line with its Vision 2030. Statements on unleashing youth potential through programs to expand employable skills and to empower youth to engage in public policy processes are enshrined in various policy documents, including Vision 2030, the National Youth Policy, and the eighth National Development Plan (2022-2026).

Vision 2030. Adopted in 2006, Vision2030 has since served as a blueprint document to guide the national development planning toward improving the quality of life of Zambians (Republic of Zambia 2006). This is to be done through increased investments in health, education, and infrastructure. The aspiration of the vision is that





Zambia will become a middle-income nation by 2030. Vision 2030 is structured around seven principles:

- Sustainable development;
- Upholding democratic principles;
- Respect for human rights;
- Fostering family values;
- A positive attitude to work;
- Peaceful coexistence; and
- Upholding good traditional values.

Over time, succeeding governments have aligned their policies, including those that are youthfocused, to the goals of Vision2030. Examples include the 2015 National Youth Policy and the 2020 National Policy on Technical and Vocational Education—both envision better skilled and more entrepreneurial Zambian youth. To ensure proper implementation of Vision 2030, in 2018, the government of Zambia designed the National Performance Framework as an accountability tool with clear metrics to track progress toward Vision 2030.

Eighth National Development Plan, 2022-2026 (8NDP). The eighth NDP was adopted after the 2021 presidential elections, in which the manifestos of the main competing parties included proposals for agriculture development and youth empowerment (UPND 2021, Patriotic Front 2021). This focus on youth in the election platforms reflected a recognition of the need to reduce unemployment among youth in Zambia, which stood at 17 percent in 2021, having grown from 14 percent in 2005.

8NDP outlines the country's investment priorities in four strategic areas:

- Economic transformation and job creation,
- Human and social development,
- Environmental sustainability, and
- Good governance environment.

The development plan recognizes that increased investment in the agriculture sector, in skills development, and in science, technology, and information and communication technologies (ICT) for digital transformation and innovation are necessary for creating decent jobs, especially for youth, under the economic transformation and job creation agenda.

Specific to youth and food systems transformation, 8NDP set out several priority investment areas:

- Providing equitable access to agricultural services;
- Promoting science, technology, engineering, and mathematics (STEM) and technical, vocational, and entrepreneurship skills for the youth workforce; and
- Investing in infrastructure, research and extension, and agribusiness development.

These investments are expected to improve national food security and create employment opportunities along agricultural value chains. The government has committed to providing sustained financing to the national TEVET system and enlarging and decentralizing the skills development bursary scheme for improved access by vulnerable youths to skills training. The government is set to spend an average of almost ZMW 240 million annually on the Skills Development Fund from 2022 to 2026. To further promote STEM education; science, technology, and innovation (STI); digital skills; and increased research and development in secondary and tertiary educational institutions, the government will utilize additional resources, such as the Strategic Research Fund and the STI Youth Fund (Republic of Zambia 2023).

National Youth Policy. The National Youth Policy was adopted in 2015 as a replacement to the 1994 and 2006 Youth Policies. It provides a revised framework to tackle both old and emerging concerns of Zambia's youth, including their everincreasing levels of unemployment (MOYS 2015a). The policy reform was motivated by the need to ensure that the Youth Policy considers emerging issues and opportunities, such as increased exposure of youth to information–70 percent of internet users in Zambia are youth–and the expanding economic opportunities available in Zambia's cities, which results in increased rural to urban migration (UNDP-Zambia 2023).

In this regard, the revised Youth Policy aims at ensuring youth mainstreaming and coordination of the Government's efforts toward holistic youth development and economic empowerment through

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focused programs and investments in youth employment, entrepreneurship development, education and skills development, health and cultural promotion, creative industries, and sport (MOYS 2015a). In the same year, the Government adopted an Action Plan for Youth Empowerment and Employment, which mainstreams youth employment in critical sectors of the economy. The Strategy proposes an integrated package of youth economic support services, including mentorship, entrepreneurship skills training through Technical and Vocational Education training centers, business development services, and marketing support services (MOYS 2015b).

National Technical Education, Vocational and Entrepreneurship Training (TEVET) Policy. The National TEVET Policy was adopted in 2020 to replace the 1996 Policy. The implementation of the earlier policy was adversely affected by several challenges, including a lack of sustainable funding mechanisms and limited linkages with industry. Faced with the challenges of an ever-increasing youth population unable to pursue studies in the formal education system and rising numbers of unemployed graduates and school drop-outs, the revised policy aims to leverage public and private resources to strengthen TEVET delivery of skills training at all levels. Under the policy, the human and infrastructure capacity of secondary schools, vocational training centers, trades training institutes, and technical colleges will be increased to absorb all categories of unemployed youth who need to be better equipped with employable entrepreneurship skills to engage productively and profitably in Zambia's labor markets (MOHE 2020a).

Implemented by the Ministry of Higher Education, the policy objectives include:

- Increasing access and enrollment in TEVET through the expansion and equipment of TEVET infrastructure across Zambia for skills training and promotion of apprenticeships and other workplace-based training.
- Promoting the quality and relevance of TEVET by ensuring the availability of quality human resources, quality monitoring, and mainstreaming the use of information technology at all levels of TEVET. This includes involving the private sector in providing skills to TEVET learners.

- Promoting innovation and entrepreneurship development through business incubators and providing strategic support to enterprises launched by TEVET graduates.
- Sustaining TEVET sector funding through implementing the Skills Development Fund and other incentives for the private sector to develop the skills of Zambian youth (MOHE 2020a).

To achieve one of the TEVET Policy's main objectives, Zambia's government introduced the TEVET bursary to enable the most vulnerable youth to benefit from skills training. The TEVET bursary obtains its finances from the Skills Development Fund and is managed by the Ministry of Technology and Science. Applications to the TEVET bursary are made via an online system. Beneficiaries of the TEVET bursary are then selected based on financial vulnerability and priority training programs, such as in science, technology, engineering, and mathematics (STEM) fields. In 2022, almost 9,000 students were awarded TEVET bursaries to train in courses that included general agriculture, food and beverage production, automotive mechanics engineering, electrical engineering, computer studies, biomedical engineering, and science laboratory technology (MOTS 2022, TEVETA Zambia 2022a, MOTS 2024).

Skills Development Levy Act, 2016. The Skills Development Levy Act provides for a skills development levy of 0.5 percent of gross emoluments to be channeled toward the funding of technical and vocational education and entrepreneurship training (GOZ 2016). The Zambia Revenue Authority collects the levy. The funds are then utilized by the Ministry of Higher Education, the supervising ministry of the Skill Development Fund, within its Technical Education, Vocational, and Entrepreneurship Training Authority (TEVETA) (ZRA 2020). Between 2017 and 2019, over ZMW 180 million (USD 7.8 million) was released to the Skill Development Fund from the proceeds of the Skill Development Levy (MOHE 2020b). The funds are used to cover_costs related to infrastructure and equipment for TEVET institutions, pre-employment training, employerbased training, and informal sector and small- and medium-enterprise training (UNESCO 2022).

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National Strategy on Financial Education for Zambia, 2019-2024 (NSFE II). Approved in 2019, NSFE II is designed to provide a framework for financial education efforts across Zambia (MOF 2019). This second strategy is a follow-up to the first NSFE, which covered the period from 2012 to 2017. NSFE I focused on improving financial literacy, raising awareness of available financial products and building skills on informed financial decision-making. NSFE I contributed to reducing the financial inclusion gap in Zambia-the level of financial inclusion rose from 59 percent (4.8 million adults) in 2015 to 69 percent (6.6 million adults) in 2020 (BOZ 2020). At the same time, the percentage of youth aged 26 to 35 years who are financially included rose from 21 percent in 2015 to 29 percent in 2020. Building on the achievements of NSFE I and through intensified financial literacy campaigns, such as youth clubs in schools and communities, NSFE II aims to increase the percentage of financially included youth from 55 percent in 2015 to 82 percent in 2024 (MOF 2019).

National Health Strategic Plan, 2022-2026. Zambia's government recognizes that good health among its citizens is vital for sustainable economic growth and development. The 2022-2026 National Health Strategic Plan, developed by the Ministry of Health, lays out a number of priorities for strengthening health sector delivery to the general population in Zambia (MOH 2022).



Regarding youth health, the strategy outlines interventions to promote adolescent health through improved access to health services, including delivery of sexual and reproductive health services. Specifically, the adolescent health interventions were estimated to cost ZMW 3.04 billion (USD 131 million) by 2026 (MOH 2022). The plan aims to increase the proportion of districts with the capacity to provide a minimum adolescent health service platform from 60 percent in 2021 to 100 percent by 2026. During the same period, the strategic plan also aims to increase adolescents' awareness and utilization of available health services through innovative social and behavior change communication platforms, such as social media, radio, and TV.

National Agricultural Policy. The National Agriculture Policy was adopted in 2016 to provide a policy framework to orient government's and partners' efforts in agriculture development (MOA and MOFL 2016). The policy is articulated around ten policy objectives, which revolve around developing a sustainable agricultural sector to ensure food and nutrition security and increased employment opportunities and incomes. For example, under its objective 10, the policy supports the promotion of youth and women to participate in the agricultural services, and the development of agricultural services to the agricultural services and the development of agricultural technologies that are appropriate to them. Other objectives include



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increasing agricultural production and productivity through improved farm inputs and infrastructure, such as irrigation, mechanization, and rural roads (objective 1), and strengthening the capacities of agricultural training institutions by increasing their human and infrastructure capabilities to train the skilled labor force that will match the needs of Zambia's agrifood industry (objective 3).

Comprehensive Agriculture Transformation Support Programme (CATSP). CATSP was adopted in 2023 as the flagship investment plan for Zambia's agricultural sector. It reflects the ambitions of the Zambian government for agriculture and rural modernization in line with 8NDP and Vision 2030 (MOA 2023). The plan sets out policy and institutional reforms and targeted investments–including in rural infrastructure, irrigation, mechanization, and research and extension–to improve agricultural productivity and commercialization.

In addition, CATSP outlines plans to engage Zambia's youth in unleashing their creativity and employment potential to transform the country's agrifood value chains, including in primary production, processing; trading, and retailing and in providing agricultural services of various sorts. The investment areas described in CATSP include those that will improve youth's access to needed skills. One dimension of this is reforming the agricultural vocational training curriculum to reflect labor market needs and emerging entrepreneurship opportunities in Zambian agriculture. To improve access to agricultural finance, the Government, through CATSP, aims to establish a Youth Agriculture Loans Facility to de-risk credit provision to youth-owned agrifood enterprises.

4. Programmatic Interventions

In collaboration with its development partners, the Government of the Republic of Zambia has implemented several skills and entrepreneurship development programs to concretize its youth engagement and empowerment objectives in various development sectors, including agrifood systems. This includes preparing school leavers for employment, involving youth in agriculture and other sustainable ventures, assisting skilled youth to start small businesses that employ other youth, promoting youth cooperatives, supporting viable economic projects to reduce unemployment



and improve living standards, and prioritizing the use of ICT for job creation. The strategies to achieve these objectives include opening new industries, supporting youth entrepreneurship, providing credit lending facilities, utilizing for youth development otherwise unused facilities, offering youth extension and technical services, commercializing youth agricultural activities, and strengthening systems and structures to coordinate and manage youth entrepreneurship efforts. All these efforts are to reduce youth unemployment and to improve their living standards.

Program on "Unleashing scalable solutions for youth empowerment and employment in Zambia". In collaboration with the United Nations Country Team for Zambia, the Ministry of Youth, Sports and Arts (MYSA) launched in December 2022 phase one of the program, "Unleashing scalable solutions for youth empowerment and employment in Zambia". The program's first phase focuses on improving the well-being of and economic opportunities for youth. Its objective is to improve the employability of young Zambians and amplify the economic returns they obtain from their work. This will be done by enabling Zambian youth to acquire the skills and experience that Zambian employers look for in their workers. The program is designed under the government's renewed approach to multisectoral coordination, focusing on integrating service provision and testing scalable solutions (MYSA 2023b). The program is part of a range of initiatives by the government to meet the changing needs of young people so that they can contribute effectively to the economic development of Zambia. As such, in 2023, the first cohort of 2,000 young people was selected under the program and placed into internships in a range of public, private, and civil society organizations, including many operating in the agrifood sector (Lusaka Times 2023).

Youth Empowerment Program (YEP). Through MYSA, the Government of Zambia is implementing a multisectoral approach through YEP in partnership with the National Youth Development Council. YEP aims to empower registered youth organizations, cooperatives, and entrepreneurs to contribute to sustainable national development through various initiatives. The program objectives include encouraging marginalized and unemployed youth to engage in income-generating projects, promoting the development of competitive youthowned enterprises, providing business support



services, creating employment opportunities, and promoting financing for innovative entrepreneurial business ideas (GoZambiaJobs 2020).

The nationwide skills training programs under YEP are to be implemented in 100 constituencies by 81 training institutions registered with TEVETA. More than 7,100 youth are to be trained in nearly 40 skills courses. Some of the vocational skills courses offered include food production and nutrition, general agriculture, automotive mechanics, computer and ICT studies, design, metal fabrication and welding, electrical engineering, and plumbing, among others (TEVETA Zambia 2022b).

Youths interested in acquiring a loan from the Youth Empowerment Fund under YEP are required to submit their applications to the Ministry, which then selects qualifying projects. The application forms are available online and in all provincial MYSA and National Youth Development Council offices (Recruitment Record 2023).

Youth Compact of the Technologies of African Agricultural Transformation (TAAT). The African Development Bank (AfDB) created the Youth in Agribusiness Compact in 2018 to support and empower young entrepreneurs in Africa's agricultural sector by introducing them to agribusiness value chains and profit-making strategies. The TAAT program, funded by AfDB, aims to enhance agricultural productivity in Africa by implementing effective advanced agricultural technologies. The Youth in Agribusiness Compact, also known as ENABLE-TAAT (Empowering Novel AgriBusiness-Led Employment), offers training and support for youth-led agribusinesses to grow and succeed. In Zambia, the compact has succeeded in helping young people earn a living through the aquaculture value chain (IITA 2022). It aims to connect the drive and passions of young people to improvements in nine agricultural value chains-cassava, orangefleshed sweet potato, aquaculture, small livestock, high iron beans, maize, rice, sorghum and millet, and wheat. These connections are to result in the creation of new agricultural businesses, more job opportunities for youth, decreased reliance on imported food, increased value added to products, and improved nutritional security in Zambia and across Africa (ENABLE-TAAT 2023).

The program boosts agricultural productivity by deploying high-performance technologies for the nine agricultural value chains. It also addresses transversal issues like soil fertility management, water management, capacity development, policy support, and African youth agribusiness (AfDB 2021). In 2018, ENABLE-TAAT trained 30 young people in Kaoma on aquaculture and poultry. Following the training, the participants formed three youth groups–Innovative, Mulamatila, and Future Feeders. Before the training, the youth involved had limited knowledge and experience with aquaculture and poultry (IITA 2021).



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Farmer Input Support Programme (FISP) electronic voucher system. The Government of Zambia launched FISP in 2002, through which smallholder farmers are provided commercial maize seed and inorganic fertilizers at subsidized prices. FISP, implemented by the Ministry of Agriculture, has played a central role in Zambia's efforts to develop its agriculture sector. Youth are among the targeted beneficiaries of the program. Its primary goals are to improve food security, increase incomes, and foster the growth of private sector input supply chains (PMRC 2018).

The FISP program increasingly has used electronic vouchers to distribute specific farm inputs to beneficiaries. This has included offering smallholder farmers subsidized access to planting materials for other crops, like groundnut, orange maize, common bean, and cottonseed, enabling them to expand their farming activities and diversify their production. FISP specifically targeted many young people in distributing these electronic vouchers.

Moreover, the electronic vouchers have resulted in the growth of agro-dealer businesses across the country. In 2013, FISP resulted in new employment in agro-input supply for over 3,000 young men and women nationally (Machina, Namonje-Kapembwa and Kasoma 2018). These agro-dealers sell chemicals, fertilizers, and improved seed varieties



and offer training to farmers to guide them in making effective use of the inputs. The number of farmers who benefitted from the program rose from 120,000 in 2002/03 to approximately 900,000 in 2012/13. In the 2023/24 farming season, the targeted beneficiaries countrywide were just over one million small-scale farmers, including youth.

In the 2016/17 farming season, the Ministry included weather index insurance in the FISP subsidy provided to farmers. Weather index insurance utilizes satellite technology to track and predict weather conditions affecting agricultural output levels in specific regions. It automatically identifies locations with a lack or an excess of rainfall and financially compensates participating farmers, including young farmers, affected in those areas by these adverse crop production conditions (Mlambo 2019).

Youth Development Fund (YDF). In 2006, the Government of Zambia established YDF to support young entrepreneurs nationwide. The fund, managed by the Ministry of Youth, Sport and Arts, aims to involve youth in the country's economic development, encourage marginalized and unemployed young people to start incomegenerating projects, promote the growth of youthowned businesses, support rural development, provide business services for sustainable youth enterprises, and create employment opportunities



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for youth through sustainable projects (Tambulukani 2018). The YDF Loan is offered to young entrepreneurs who own businesses in specific sectors, including manufacturing, agriculture, health, education, and tourism. The loan can also be used to support economic activities in other sectors, as determined by the YDF Technical Committee (MOYS 2012).

In 2014, approximately 1,300 young people in the country received financial support from YDF. The largest number of beneficiaries was in Lusaka, which has the largest youth population, followed by Copperbelt province. The lowest number of beneficiaries was in Muchinga province. Overall, the distribution of funds was reasonably proportional to the size of the youth population in each province.

YAPASA: Developing youth-led enterprises in rural areas of Zambia. Between 2013 and 2019, the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO), and the Zambian Government collaborated on the Yapasa Project. The project addressed youth unemployment in rural areas of Zambia by promoting the development of sustainable micro, small, and medium enterprises that would create job opportunities for young men and women (FAO 2018b). YAPASA sought to address youth unemployment and food insecurity in rural communities by helping young people establish sustainable businesses. The project focused on promoting small and medium-scale enterprises in the soybean and aquaculture value chains, but later expanded to other commodity value chains, such as horticulture (BEAM 2019). YAPASA operated in the Northwest and Central parts of Zambia (ILO 2018). The project successfully created around 3,000 jobs for rural youth in Zambia and improved the performance of over 5,000 youth-led rural enterprises (FAO 2018b). It promoted collaboration between different actors in the agrifood value chains and stronger connections between small producers, particularly young farmers, and larger agribusinesses.

Youth Lead Activity. USAID/Zambia funded the Youth Lead Activity from 2018 to 2021. Its aim was to support and connect youth leaders in Zambia, helping them to increase the impact of their work and to foster and encourage their civic engagement. The project enhanced youth development in Zambia by offering internships



and mentorship opportunities in various sectors, providing leadership and civic engagement skills to Zambian youth, and encouraging them to identify and address issues they are passionate about. Additionally, the program focused on strengthening local institutions by improving the capacity and networking of government entities, businesses, and civil society organizations that participate in youth internship programs and supporting the National Youth Development Council (NYDC) in involving youth in policymaking and other government activities.

NYDC established a 25-member Youth Lead Activity project Advisory Board made up of youth leaders, faith-based organizations, local and international civil society organizations, business leaders, and government officials. The Board used a co-creation process, including a youth mapping exercise, to design a training curriculum for project beneficiaries. Twenty-five youth were trained in research and interview skills as part of this design process, so they were engaged in the design of internship and training components of the Youth Lead Activity. Under the project, over 100 youth obtained internships or were being mentored at 66 public and private sector institutions, participating in ongoing civic education and leadership skills training. The first cohort of 44 youth completed their internships and identified critical issues within their communities on which to continue to work and resolve, focusing on women's rights, governance, and health. Nineteen of the interns were hired by their internship host at the end of their internships (NGOConnect 2020).

Constituency Development Fund (CDF). In evaluating Zambia's efforts to create employment opportunities for youth in agrifood systems, CDF emerges as a pivotal tool. Established in 1995, the CDF provides Members of Parliament and their constituent communities with the funding to design and implement local development projects in line with their needs and preferences (Chibomba 2013). CDF has become a crucial mechanism funding community-level development for projects (Decentralisation Secretariat 2023). Its budget per constituency significantly increased from approximately ZMW 1.6 million in 2021 to ZMW 30.8 million under the 2024 budget. There is a current practical devolution of development efforts to local levels as communities start participating in decision-making on how development funds are to be spent.

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Youth are involved in these decision-making processes. The growth in CDF resources allows for more targeted investment in community-based projects, substantially benefiting young people, especially in agricultural entrepreneurship, skill development, and training. By financing local initiatives, CDF supports creating employment opportunities and fosters youth entrepreneurship in the agrifood sector. It contributes to skill enhancement through educational and training programs, thus addressing the unique needs of youth and integrating them more effectively into the agrifood systems. Additionally, CDF facilitates youth participation in local governance and decision-making processes, enhancing its impact on youth empowerment in agriculture. This aligns well with Zambia's broader goals of fostering youth employment and skill development in this sector, making CDF a cornerstone in Zambia's strategy to empower its youth in local agrifood systems.

Citizens Economic Empowerment Commission (**CEEC**). CEEC, established under the Citizens Economic Empowerment Act No. 9 of 2006, promotes inclusive economic growth and empowerment in Zambia. Its main objective is to support and integrate underprivileged and marginalized groups, including youth, into the mainstream economy. Over the past 15 years, CEEC has received financial support from the government to aid businesses across all 116 districts of Zambia.

In 2022/23, there was a notable increase in the Empowerment Funds released annually by the Treasury to just under ZMW 900 million. CEEC provided over ZMW 150 million to traders in Marketeer Booster Loans and over ZMW 500 million to 535 small and medium-sized enterprises and cooperatives. Additionally, over ZMW 50 million was allocated to more than 50,000 loan applicants,



including women (33 percent of recipients) and youth (52 percent) (CEEC 2023). The financial support provided by CEEC is estimated to have supported the creation of 135,000 jobs, either directly or indirectly, contributing to reducing unemployment and enhancing livelihoods. Loan recovery rates improved to 66 percent in 2023 from 27 percent in 2022.

5. Conclusion

This study has highlighted the efforts of the government of Zambia in youth empowerment and engagement in the transformation of agrifood systems nationwide. The country has established several institutions and policies to ensure youth concerns and needs are heard in public policy processes and investment programming toward achieving Vision 2030. The recently approved Comprehensive Agricultural Transformation Support Programme (CATSP) puts youth and enhancing their skills at the center of driving the much-needed transformation of Zambian food systems while maintaining focus on strengthening the human and infrastructure capabilities of TEVET institutions through the proceeds of the Skills Development Levy.

Despite many commendable achievements, the reach of ongoing initiatives is small relative to the large share of Zambia's population made up by youth. Zambia would greatly benefit from establishing and effectively implementing flagship policies and programs to improve youth access to skills, land, and finance, as highlighted in 8NDP and CATSP. Moreover, strengthening and incentivizing the involvement of the Zambian private sector in skills provision would allow youth graduates to acquire skills that are more greatly demanded by employers, as well as strengthen their entrepreneurial abilities.



1. Introduction

With 62 percent of its population of 15.8 million persons aged 18 to 35 years, Zimbabwe takes pride in being a youthful nation (Reserve Bank of Zimbabwe 2022, ZIMSTAT 2016). Zimbabwe has shown an unwavering commitment to invest in human capital development over the years. Ninety-five percent of education financing in Zimbabwe comes from domestic resources. From 2020 to 2022, 13 percent of the national budget was allocated to education, down somewhat from the peak budget allocation of 22 percent in 2015 (UNICEF 2022). These investments have allowed the country to achieve a 90 percent literacy rate among its youth (FHI360 2018, ILO 2019c).

However, Zimbabwe faces a persisting challenge of youth unemployment-the 2019 Labour Force and Child Labour Survey Report estimated that 55 percent of youth (ages 15 to 35 years) are unemployed (ZIMSTAT 2020). In response, the Government of Zimbabwe prioritized skills development programs to empower its youth. These government efforts increased enrollment in polytechnics and industrial training colleges from 20,300 students in 2015 to an estimated 32,700 in 2020 (ILO 2019c).

Thirty-seven percent of Zimbabwe's youth are employed in agriculture (ZIMSTAT 2020). Zimbabwe is making substantive investments in revitalizing its agricultural sector and ensuring that youth have the skills they need to take up decent employment opportunities arising from the transformation of food systems in the country (MoFED 2022a). Agricultural production is increasing in Zimbabwe. The Agriculture Production Index per capita (2014-2016 = 100) for 2021 was 114.8 (FAO 2023a). In 2022, agriculture contributed 11.7 percent of Zimbabwe's GDP and 18 percent of total exports (Reserve Bank of Zimbabwe 2022).

This case study provides a systematic narrative review of the major institutional and policy innovations and programmatic interventions that the government and its partners have taken to empower Zimbabwe's youth by improving their access to productive resources, such as skills, land, and finance. These resources will enable youth to increase their participation in decent employment in Zimbabwe's food systems.

2. Institutional Innovations

Owing to their growing share of Zimbabwe's population coupled with their increasing voting power, Zimbabwean youth have been bargaining more effectively for policies and institutions more responsive to their needs and concerns (YETT 2018). In 2009, Zimbabwe signed the African Youth Charter, which commits African states and civil society organizations to address the economic, social, educational, and spiritual needs of African youth (African Union 2006).

Competition to entice the political support of Zimbabwe's youth is felt across the country's political arena, particularly in the manifestos of political parties, many of which have established youth wings. Leveraging their appetite for digital media, youth are increasingly making their voices heard in public policy spheres. The Government has responded by designing institutions to implement youth empowerment policies (Moyo 2023, Oosterom and Gukurume 2019). In this regard, the Constitution of 2013 also requires the state to promote affirmative action for youth empowerment (Republic of Zimbabwe 2013a).

The national youth machinery includes institutions such as the Ministry of Youth, Sport, Arts, and Recreation; the Zimbabwe Youth Council; and youth-led civil society organizations. In addition, in 2022, the Parliament of Zimbabwe established a Youth Caucus to foster and aid in the design of youth-friendly policies and legislation (IPU 2023).

Ministry of Youth, Sport, Arts and Recreation (MoYSAR). Since Independence there has been a government portfolio for young people. This shifted between the Ministries of Women's Affairs and that for Education. A fully-fledged ministry for youth only emerged in the 2000s following the institutionalization of the African Youth Charter (Oosterom and Gukurume 2019). The social and political changes that started in 2017 resulted in the Ministry of Youth, Indigenisation, and Economic Empowerment being restructured and renamed the Ministry of Youth, Sport, Arts, and Recreation (MoYSAR). Its mission is to lead the formulation and implementation of holistic youth empowerment and development policies.

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To accomplish this, MoYSAR has four departments–Youth Development and Empowerment, Vocational Training and Skills Development, Sport and Recreation, and Arts and Culture Promotion (MoYSAR 2022).

The Youth Development and Empowerment Department has been expanded in recent years to ensure youth mainstreaming and engagement in the planning and programming of sector ministries. An example of its efforts includes supporting the implementation of the Presidential 10-hectare Scheme to empower youth in farming. To expand skills development opportunities for youth, the Vocational Training and Skills Development Department coordinates the planning and delivery of training in vocational training centers (MoYSAR 2023). In parallel with these increased efforts to empower youth, the budget allocation to MoYSAR increased from USD 9.4 million in 2021 to USD 70 million in 2023 (MoFED 2020, 2022b).

Zimbabwe Youth Council. The Zimbabwe Youth Council was established by an Act of Parliament in 2001 (Republic of Zimbabwe 2013b). Under the supervision of MoYSAR, the Council's mandate includes ensuring youth mainstreaming across government policies and programs by organizing youth into clubs and associations so that they can make their voices and needs heard. In addition, the Council advises the Government on the needs of youth and undertakes projects designed to create employment and youth empowerment in all economic sectors. To mainstream the needs of youth in public policy and programming, the Council oversees youth desks across the sector ministries. It also engages with other government institutions in the economic empowerment of youth.

An example of its youth empowerment efforts is the introduction in 2019 of the Youth Employment Tax Incentive by the Zimbabwe Revenue Authority to incentivize the Zimbabwean private sector to employ young people (Oosterom and Gukurume 2019, ZIMRA 2022, MoFED 2019). Similarly, the Council, in collaboration with the United Nations Population Fund, supported the establishment of the Zimbabwe Youth Policy Tracking Group, which serves as a platform for young people to engage with lawmakers on issues of concern as part of the process of shaping youth-friendly policies (UNFPA 2022).

Regarding youth engagement in Zimbabwe's food systems, the Zimbabwe Youth Council, in collaboration with other government agencies, set up innovation hubs at tertiary-level educational institutions to better enable youth to pursue careers in agrifood systems. For rural youth, the Council, in collaboration with the Ministry of Agriculture, is establishing and promoting Community Youth Hubs to enable increased value-addition to agricultural products at their



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source-hence, fostering entrepreneurship and creating employment within rural communities. The Council has also supported several youth-led organizations focused on agriculture, including the Zimbabwe Young Farmers Association for Sustainable Development. This group of young farmers actively leverages the social media abilities of young people to communicate success stories of youth in agribusinesses through videos and virtual demonstrations.

Ministry of Lands, Agriculture, Fisheries, Water, Climate, and Rural Development (MLAFWCRD). MLAFWCRD is mandated to provide technical, extension and advisory, regulatory, and administrative services to achieve food security in Zimbabwe and to meet the country's economic development targets. Specifically for youth, the Ministry is responsible for prioritizing efforts to ensure that they benefit from public agricultural development schemes and investments (Malabo Montpellier Panel 2022c).

To ensure youth mainstreaming in policy and planning, a Chief Programs Coordinator leads MLAFWCRD's Agricultural Youth Desk. As a result of its engagement, there have been improvements in youth awareness of the economic opportunities they might pursue in food systems. The Agricultural Youth Desk also works to improve the engagement of youth in the Ministry's flagship projects, such as those focused on agricultural mechanization, irrigation development, horticulture, aquaculture, and livestock. Examples of agricultural programs in which youth are targeted as beneficiaries include the Presidential Input Scheme to improve farmers' access to modern farm inputs (Pindiriri, et al. 2021) and the Presidential 10-ha Scheme, which is geared toward improving youth's access to land (Dube-Matutu 2023).

Youth access to finance: EmpowerBank. EmpowerBank is a government-owned institution launched in 2018 to improve access to finance for youth and their businesses (MoFED 2022b). Unlike commercial banks, EmpowerBank attracts most of its youth clients through tailored products, such as providing microloans with low or no collateral requirements and business training that addresses the challenges of its youth clientele (YETT 2018). The bank has several loan products to fit the needs of underserved youth. These include the Youth Business Starter Pack for new entrepreneurs, while the Thuthuka loan product provides micro



loans to small businesses, including farmers, who require working capital to grow their businesses (EmpowerBank 2022).

EmpowerBank's loan size ranges from USD 100 to 5,000. The interest rate for short-term loans is 10 percent per month, while for other loans, it is 8.5 percent per month. As of January 2022, the bank reported having made loan disbursements to over 3,000 beneficiaries. Sixty-five thousand young people have also received financial literacy training through its programs.

3. Policy Innovations

To respond to the needs and concerns of young people, the Government of Zimbabwe initiated several policy and legislative reforms in line with the provisions of the Constitution to promote holistic youth empowerment through education, healthcare, and decent employment, among others. Key policies focused on youth include, among others, the National Youth Policy and the Financial Inclusion Strategy.

The Constitution. The Constitution of Zimbabwe, as adopted in 2013, provides extensive details on protecting and guaranteeing basic human rights for youth, including the right to work and equal access to healthcare, education, and economic opportunities, as well as their engagement in public policy development (Republic of Zimbabwe 2013a). Section 20 of the Constitution requires the state to demonstrate a high level of commitment to protecting and enforcing youth's rights and promoting affirmative action for youth. In addition, the Constitution bestows the duty of facilitating rapid and equitable agricultural development to the State. In line with this duty, the state seeks to formulate and implement policies that will permit the youth of Zimbabwe to access the productive resources and skills they require for their economic ventures in agrifood systems to flourish.

Vision 2030. Inspired by the global Sustainable Development Goals, Zimbabwe Vision 2030 was adopted in 2018 as the country's development blueprint. It reflects the government's long-term development ambitions to progress "towards a prosperous and empowered upper middle-income society by 2030, with job opportunities and a high quality of life for its citizens" (Republic of Zimbabwe 2018)'. Regarding youth empowerment, Vision 2030's objectives are geared toward increased

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investments to improve the access of Zimbabwe's youth to education, housing, health services, employment opportunities, and other essential services. Vision 2030 identifies empowered and skilled youth as necessary to drive agricultural development in Zimbabwe so that the agricultural sector effectively contributes to achieving the national ambitions of re-positioning Zimbabwe as the breadbasket of Southern Africa. These efforts will be supported through substantive public investments in infrastructure for agricultural research, extension, mechanization, irrigation, and improved access to markets.

National Development Strategy, 2021-2025 (NDS1). The National Development Strategy (NDS1) was approved in 2020 as the first five-year Medium Term Plan to guide strategic investment toward realizing Zimbabwe's Vision 2030 (Republic of Zimbabwe 2020). NDS1 proposes strategic measures on macroeconomic stability and investments in soft and hard infrastructure to spur economic growth. The strategy's priorities include:

- Economic growth and stability;
- Food security and nutrition;
- Governance;
- Moving the economy up the value chain and structural transformation;
- Human capital development;
- Environmental protection;
- Climate resilience; and
- Natural resource management.

Considering that empowered and skilled youth can be an engine for the desired growth, NDS1 emphasizes youth mainstreaming across public policies and investments to promote holistic positive youth development through education, including Technical and Vocational Education and Training (TVET); healthcare; and sports and recreational facilities. Hence, NDS1 seeks to improve the participation of youth in public decision-making and development processes from 3 percent of those involved in 2020 to 25 percent by 2025. At the same, the number of youths who access empowerment opportunities in all sectors of the economy will be increased from 16,000 in 2020 to 200,000 by 2025.



Regarding food systems transformation, NDS1 prioritizes investments to expand the amount of land under irrigation, in research, in the dissemination of drought-resistant seed varieties, in improving the capacity of agricultural extension services, and in upscaling climate-smart agriculture practices. In 2022, the government allocated approximately USD 186 million, 6.2 percent of the national budget, to food and nutrition security activities (Malabo Montpellier Panel 2022c). Zimbabwe's Ministry of Finance and Economic Development reports that the implementation of NDS1 allowed the country to reverse declining economic growth trends and achieve a positive growth rate of 6.5 percent in 2022 (MoFED 2023).

Revised National Youth Policy, 2020-2025. Following the 2000 and 2013 versions of the national youth policy (MoYDIE 2013), a revised policy was adopted in 2021 to accommodate emerging opportunities and issues affecting Zimbabwe's youth (Zimbabwe Cabinet 2021). The revised policy guides the government in leading an integrated approach to promoting youth-positive development and empowerment, increasing their participation in policy formulation and implementation, and granting them equal access to economic, political, and social opportunities. The goal of the 2021 youth policy is to create "an empowered youth actively involved in national development". The policy is articulated around four thematic areas:

- Education and skills development;
- Employment and entrepreneurship;
- Youth governance and participation; and
- Health and well-being.

The policy particularly emphasizes strategies for harnessing the demographic dividend that youth present to Zimbabwe's economic development. This will be achieved through expanded and improved investments in education and skill development, especially in existing vocational training facilities.

Regarding promoting youth employment and entrepreneurship, the policy envisages creating an enabling environment for active involvement of the private sector in skills provision to youth, providing entrepreneurship training, expanding incubation hubs, and improving access to business

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start-up resources and other support. Owing to the notably low representation of youth in key sectors of the economy, one of the most significant policy changes stipulated in the revised youth policy is the provision of an enforceable 25 percent youth quota for employment in key economic sectors, such as agriculture and mining. Also, one-quarter of public procurement is to rely for supply on youth-owned firms. Finally, the policy seeks to strengthen youth focal desks across government ministries to ensure youth mainstreaming and better coordination of the ministries' programs that target youth.

Zimbabwe National Agriculture Policy Framework,

agricultural 2019-2030. This development framework was adopted in 2019 to serve as a holistic blueprint for guiding efforts on agricultural modernization for income and wealth generation in line with the national development agenda outlined in Zimbabwe Vision 2030 (MoLAWCRR 2018). It outlines actions to fast-track the achievements of the Maputo Declaration (2003) and Malabo Declaration (2014) on accelerating agricultural growth for food and nutrition security (African Union 2003, 2014). With a focus on the private sector in the transformation of food systems and ensuring women and youth mainstreaming in investments in agrifood systems in Zimbabwe, the policy framework is articulated around nine pillars to support the resilient growth of the agricultural sector.



- Food and nutrition security and resilience;
- Agricultural knowledge, technology, and innovation systems;
- Production and supply of agricultural inputs;
- Development of agricultural infrastructure;
- Agricultural marketing and trade development;
- Agricultural finance and credit;
- Access, tenure security, and land administration;
- Resilient and sustainable agriculture; and
- Institutional arrangements for policy implementation.

Specific investments will be made in irrigation development and water harvesting technologies, agricultural mechanization, scaling up of agricultural insurance, and in early warning systems to reduce the vulnerability of smallholder farmers to climate change.

However, the policy framework recognizes that progress toward the desired policy outcomes is still hampered by a workforce with limited skills, so currently it is unable to drive much-needed food systems transformation. The National Skills Audit showed a skills deficit of 88 percent in the



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agriculture sector. The same report highlighted a skills deficit of 94 percent in the engineering and technology skills cluster (MoHTESTD 2019). To improve skills in the current and future labor force in Zimbabwe's agricultural sector, the policy recommends improving agricultural colleges and universities and adapting the curricula they use to address the specific challenges faced by Zimbabwe's farmers, including climate-resilient sustainable intensification, early warning systems, managing pests and diseases, and nutrition, while also offering practical training to guide the interactions of agricultural extension staff with farmers (Malabo Montpellier Panel 2022c).

Technical Vocational Education and Training (TVET) Policy. Adopted in 2023, the TVET policy aims to strengthen and streamline vocational education for youth to ensure that the content and skills delivered matches the needs of the labor market. In the past, vocational education in Zimbabwe was hampered by the scattered delivery of TVET programs whereby line ministries, such as health or education, ran their own TVET programs without a clear policy framework to coordinate all the institutions involved in skills development programs (ILO 2019c). The TVET policy provides an institutional framework for amalgamating them.

To achieve its goals of imparting employable skills to the youth, the TVET policy focuses on increasing investments and funding in developing and maintaining physical and digital infrastructure and enhancing the quality of TVET trainers. The policy also seeks to improve the capacities of TVET institutions to generate and commercialize innovative products and services. To ensure the inclusion and retention of youth from poor backgrounds in TVET programs, the policy introduced a work-for-fee program through which students can work for the training institution in exchange for their tuition fees (Harare Post 2023). As a follow-up to the implementation of the policy, to ensure the enrollment in TVET facilities of vulnerable youth, especially those out of school, in August 2023, the Government approved measures to revamp the 45 fully-fledged Vocational Training Centers and 25 satellite centers and to establish one vocational training center in each of Zimbabwe's 64 districts (Zimbabwe Cabinet 2023).

To complement the skills delivery by TVET institutions, the Government set up innovation hubs in higher education institutions to provide technical and research-based solutions for skills



enhancement in Zimbabwe's labor force. The innovation hubs are also to equip students with specific industrial skills and to enable them to operate entrepreneurially so that they successfully incubate any businesses they create. Beneficiary sectors for these innovation hubs are agriculture, energy, and mining. Progress has already been made in promoting value-addition for agricultural products.

National Financial Inclusion Strategy, 2022-2026.

Considerable progress in reaching youth was registered under the implementation of the first National Financial Inclusion Strategy between 2016 and 2020. Among the successful initiatives of the first strategy were the establishment of EmpowerBank, a bank dedicated to young people; financial literacy programs; and youth-dedicated desks in commercial banks. These efforts increased youth financial inclusion from 67 percent in 2014 to 83 percent in 2022.

The government designed the second National Financial Inclusion Strategy (2022-2026) (NFIS II) to build on the achievements of the first NFIS, particularly to further expand the financial inclusion of youth (Reserve Bank of Zimbabwe 2022, Tarinda 2019). NFIS II has four pillars:

- Financial innovations;
- Financial consumer protection and financial capability;
- Microfinancing; micro, small, and medium enterprises (MSME) and entrepreneurship development; and
- Devolution.

NFIS II aims to increase access to financial services for all Zimbabweans from 83 percent to 95 percent by 2026. The strategy aims to promote youth access to finance by developing more financial products that are tailored to their needs, as well as offering youth-targeted financial education and entrepreneurship development programs (Reserve Bank of Zimbabwe 2022).

4. Programmatic Interventions

Over the years, the government of Zimbabwe has piloted several youth empowerment initiatives with some level of impact and success on youth livelihoods. Those include, among others, the Pfumvudza program, the establishment of



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EmpowerBank, and initiatives to promote youth entrepreneurship (Yingi 2023). Here the most recent and ongoing initiatives are described.

Improving youth's agricultural productivity-Pfumvudza program. Launched by the government of Zimbabwe in June 2020, the Pfumvudza program aims at strengthening the resilience of smallholder farmers to climate shocks and erratic rains by promoting conservation agriculture practices-Pfumvudza-and providing improved inputs to increase productivity levels (Mavesere and Dzawanda 2023). The program targets 1.8 million smallholder farming households. Beneficiaries are supported with agricultural extension services and an inputs grant package that includes improved seed and inorganic fertilizers sufficient for a 0.125 ha plot (Maseya 2020). Moreover, the Ministry of Lands, Agriculture, Fisheries, Water, Climate, and Rural Development targets 100,000 youths as beneficiaries in the conservation agriculture component of the Pfumvudza program every year, either as own-account farmers, dependents working with their parents, or farm employees. To ensure the continuity of the program, each beneficiary household returns 75 kg of maize grain after harvest as a contribution to the country's strategic grain reserve (United Nations 2022b, Tokora 2023).

The program has been instrumental in shielding farmers from poor harvests due to droughts. In Mutare South Constituency, beneficiary farmers of the Pfumvudza program were found to have realized significantly higher yields than nonbeneficiaries (Mavesere and Dzawanda 2023).

Improving youth's access to land-Presidential 10-ha Scheme. Any youth in Zimbabwe willing to venture into agricultural activities will almost certainly have limited access to land. Most were not at an eligible age to receive land distributed during the Fast-track Land Reform Program in 2000 (Chipenda and Tom 2022). The Ministry of Lands, Agriculture, Fisheries, Water, Climate, and Rural Development through its Youth Desk has been implementing the Presidential 10-ha Scheme to provide youth with access to land. Under the scheme, Provincial heads provide land to youth in the A1 and A2 resettled areas. In communal areas, youth also access land from their parents or community leaders. The Ministry reports that under the scheme annually at least 700 youths in every province of Zimbabwe have been trained and allocated land (Dube-Matutu 2023).

Supporting youth entrepreneurship. Owing to the limited economic opportunities available to rural youth, in 2022, the Government of Zimbabwe launched the Provincial Integrated Youths Skills Development Centres (PIYSDC) in all ten provinces. The program is designed to annually train 5,000 young people in good agricultural practices as an avenue for increased income and self-employment. The Government allocated 1,235 acres of land to the PIYSDCs for farming demonstrations and distributed 700 heifers and some tractors to the trainee youth as a part of starter packages.



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By late 2022, 3,000 youths had been trained at the PIYSDCs (Krishnaswami 2023, Further Africa 2022).

At the same time, urban tech-savvy youth have demonstrated ingenuity in developing start-ups to solve challenges along agrifood value chains that also provide employment. An example is IFAam, which leverages artificial intelligence and remote sensing technologies for early warning of crop pests and diseases and for timely weather information. The company also supports farmers in conducting soil analysis (Mahlahla 2023).

Another example is Skybrands, a youth-led food processing company founded by two young graduates in 2017. Skybrands partnered with the international organization HarvestPlus to promote the processing of nutritious foods based on locally available ingredients, such as vitamin A orange maize (Meyer and Walton 2019). The company has entered into off-take agreements with 100 farmers to market 400 tons of biofortified grain. In 2019, Skybrands sold 16.5 tons of biofortified vitamin A orange maize.

Finally, in Mashonaland West province, youth established Mhuri Farming to promote the production of tobacco seedlings by and for youth farmers (Mhuri Farming 2019). The firm benefitted 162 youth in the 2022/23 agricultural season, enabling them to benefit from Zimbabwe's lucrative USD 1 billion tobacco production industry.

5. Conclusion

Despite challenges in implementation, the Government of Zimbabwe has demonstrated political will in addressing some of the pressing issues and concerns of its youth through youth empowerment policies and institutions. However, most youth still operate in the informal sector and remain unemployed. While the country is making substantive investments in agricultural modernization (MoFED 2022b), more investments need to be made to ensure that the country's youth are equipped with proper skills and resources, such as access to finance and land, to take up decent employment opportunities arising from the economic growth, in general, and food systems transformation, in particular (MoHTESTD 2019). The country must continue to strengthen and coordinate its TVET delivery systems. It also must continue offering youth opportunities to engage in shaping the public policies that concern them. With proper youth empowerment and skills development opportunities coupled with the country's abundant natural resources and creativity, Zimbabwe is well-placed to derive a significant demographic dividend from its youth to drive the much-needed economic growth that will enable the country to meet the targets of its Vision 2030 for the nation's development.



9. CONCLUSION

The convergence of rapidly transforming agrifood systems and a growing young labour force has created unique opportunities to boost employment opportunities, raise incomes and reduce poverty. Enabling them to acquire the necessary education, skills, and resources and making income-generating opportunities in the agrifood sector available to them are crucial steps governments and their development partners must take to unlock the potential of youth for radically transforming economies across Africa.

This report-YOUTH AHEAD: Policy innovations to create opportunities for young people in Africa's agrifood systems-provides an overview of successful actions taken to promote Africa's youth employment in agrifood systems. The report reviews the opportunities available for youth in Africa's food systems and the challenges that inhibit them from taking up these opportunities. Overcoming these challenges would reduce youth unemployment levels, increase the continent's food security, and accelerate economic growth. The report highlights areas of progress, presents opportunities for replicating and scaling up successful interventions, and suggests possible entry points for youths to both generate income from and transform Africa's food systems. The report highlights the successful strategies implemented by the various governments in the continent. Particularly, the report draws on

the experience of four systematically selected African countries–**Ghana, Uganda, Zambia,** and **Zimbabwe**–which have successfully empowered youth in agrifood systems through policy and institutional innovations and programmatic interventions, as summarized below.

Various African governments have made significant strides in increasing young people's access to quality education. Examples include the provision of Universal Secondary Education in Ghana and Uganda and increasing young people's enrollment in science-based courses, as seen in Uganda, where biology, chemistry, physics, and mathematics are compulsory at the lower secondary school level (O-level). Increased enrollment of more African youth in science, technology, engineering, and mathematics (STEM) and more significant investment in those fields is crucial in developing agricultural technologies across the agrifood value chain that are adapted to the local context. Such specialized skills and the technologies to which they contribute will enable Africa to meet the demands for the rapid transformation and evolution of its agrifood systems triggered primarily by the digital technology-based Fourth Industrial Revolution.

Most African governments recognize the need to provide increased and enhanced skills training to their youth, as evidenced by the established policies and institutions for technical, and



vocational education and training (TVET). These policy commitments have led to the creation of institutions like Zambia's Ministry of Small and Medium Enterprises Development. This ministry cultivates and supports youth-owned enterprises through by youth with increased access to training in the skills needed by Zambia's agrifood systems. It also offers youth access to financial services and mentorship programs. Innovation hubs established in Ghana, Uganda, and Zimbabwe are crucial in helping youth transition from being job seekers to being job creators. The skills acquired from the innovation hubs can be applied in, for example, farm management and the processing of high-value crops, enabling youth to pursue a much wider set of economic opportunities for generating income.

Increased investment in agricultural innovation through public-private partnerships fosters innovation-driven agrifood systems in part by enabling young technical entrepreneurs to develop locally adapted agricultural technologies and digital solutions, thereby creating jobs and expanding the local economy. In addition to investments in youth-targeted institutions and programs, establishing financial institutions with youth-tailored products, such as EmpowerBank in Zimbabwe, or youth-focused financial initiatives, such as Zambia's Youth Development Fund and Uganda's Youth Livelihood Program, will better enable young people to establish agribusinesses and sustain them by providing them with access to the capital those businesses require.

Despite the significant efforts and progress achieved towards empowering Africa's youth through improved access to quality education, skills training, and resources, such as financial services and land, more is still needed–particularly given the continuing high unemployment rates among young people on the continent. Africa's youth still face significant economic challenges. These include the mismatch between the training they receive and the employment opportunities available, poor economic infrastructure, and restricted access youth have to resources needed to establish their agribusinesses, such as land and capital. Greater involvement of youth in policy development and implementation would help overcome these barriers. Doing so will result in programs and institutions that better support youth in acquiring needed skills, obtaining necessary resources, and exploiting employment opportunities emerging in Africa's agrifood systems.

More institutions focusing on improving youth participation in agrifood systems need to be established. Many African youth still need to gain the skills required to thrive in the agrifood sector, such as in sustainable agricultural production, processing, entrepreneurship, the application of ICT, and other agrifood-related skills. Where skills training programs are mainly project-based, their impact on youth economic empowerment is unlikely to be sustained. Although some African countries have vocational training institutions that provide hands-on training in various agrifood system skills, developing and implementing more comprehensive and systemic approaches to skills development to meet the needs of local labor markets is crucial. Establishing a network of trade schools nationally and regionally across the continent in which youth can readily find skills training within a broad range of professions would help young people acquire the hands-on training they need to pursue a specific trade of their choice, including those exploiting new economic opportunities in Africa's agrifood systems.



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