AGRIFOOD YOUTH EMPLOYMENT AND ENGAGEMENT STUDY

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AGRIFOOD YOUTH EMPLOYMENT AND ENGAGEMENT STUDY (AGYEES)

by

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EXECUTIVE SUMMARY

The Agrifood Youth Employment and Engagement Study (AgYees) examines the potential of Sub-Saharan Africa's agrifood systems to provide new jobs for unemployed, underemployed and disadvantaged youth, and identifies constraints affecting the capacity of youth to take up these economic opportunities.

Africa has the youngest population in the world, with almost 200 million people between the ages of 15 and 24—a number that is expected to double by 2045 (African Economic Outlook 2015). Although many jobs have been created by Africa's growing economies, job creation has not been enough to accommodate the expanding youth population. The International Labor Organization estimates that only 16 million of 73 million jobs created in Africa between 2000 and 2008 were filled by youth. Sixty percent of Africa's unemployed are youth, even more are underemployed, and youth unemployment rates are double those of adult unemployment in most countries (African Economic Outlook 2015). Across 34 African countries, citizens regard unemployment as the top problem facing their nations (Dome 2015). The rising youth population is increasingly better educated, and there is an unprecedented opportunity for economic and social development if the talents of this generation can be tapped. Alternatively, the youth could also present a significant threat to social cohesion and political stability if insufficient economic and employment opportunities are available. Unemployment of youth is of particularly critical concern in fragile states, with one in two youths joining rebel movements citing unemployment as the primary motivation (World Bank 2011, cited in African Economic Review 2015).

STUDY OBJECTIVES

The Agrifood Youth Employment and Engagement Study (AgYees) examines the potential of Sub-Saharan Africa's agrifood[1] systems to provide new jobs for unemployed, underemployed and disadvantaged youth and identifies constraints affecting the capacity of youth to take up these economic opportunities. Two analytical tracks generate insights and guidance on cost-effective strategies and programmatic entry points most likely to improve employment options and livelihoods for disadvantaged African men and women.

1 We define the agrifood system as the set of activities, processes, people, and institutions involved in supplying a population with food and agricultural products. The agrifood system encompasses the provision of farming inputs and services, production at farm level, post-farm marketing, processing, packaging, distribution, and retail, and the policy, regulatory, environmental, and broader economic environment in which these activities take place.

Specific activities and actors within the agrifood system include: *Farming*: those involved directly in producing crops, raising animals, and managing fisheries. *Downstream agrifood system*: those engaged in post-farm value addition, e.g., assembly trading, wholesaling, storage, processing, retailing, preparation of food for sale outside the home, beverage manufacturing, etc. *Upstream agrifood system*: those engaged in pre-farm value addition activities, e.g., farm input distribution, irrigation equipment, farmer extension services. *Off-farm within the agrifood system*: both the upstream and downstream portions of the agrifood system. *Off-farm outside the agrifood system*: all other types of employment outside the agrifood system. Agriculture is defined in the traditional sense to include crop and livestock production, hunting and related services, forestry and logging and fishery and aquaculture.

The Strategic Policy and Foresighting Analysis (Chapters 2 and 3) analyzes economic mega-trends for Rwanda, Tanzania and Nigeria and projects how economic changes, specifically farm structure and dietary transformations, will affect future job prospects for rural and urban African youth. The Agrifood Landscape Analysis (Chapters 4 and 5), focusing on Rwanda and Tanzania, examines the economic and policy environment affecting youth engagement with the agrifood system, assesses the supply and demand for related workforce training and perceived gaps, and distills best practices and lessons learned related to youth economic programming.

DATA AND METHODS

Within the Strategic Policy and Foresighting Analysis, Chapter 2 (Land/Farm) offers a detailed description of employment trends in the region, with a particular focus on men and women between 15 and 34 years of age, disaggregated into two age brackets, 15-24 and 25-34[2]. Chapter 2 also examines the role of agricultural productivity growth in promoting job growth in the overall economies of Rwanda, Tanzania, and Nigeria. The analysis utilized nationally representative and multi-year survey data from the Living Standards Measurement Study with its Integrated Surveys of Agriculture (LSMS-ISA), Labor Force Surveys, and the Integrated Public Use Microdata Series. Each dataset provides labor market information on individual household members by age, gender, and rural/urban location.

Three main employment categories were studied (farming, off-farm sector within the agrifood system, and off-farm sectors outside the agrifood system), in addition to unemployment and economic inactivity. Employment shares and employment changes over time were computed within these categories, reported both in terms of counts as stated by survey respondents and by computing "full-time equivalents" (FTE).[3] Multinomial logit models were estimated to identify the socio-economic, demographic and geographic factors shaping the employment structure over time, building on the work of McMillan and Harttgen (2014). Controlled for gender and age categories, the analysis also disaggregated by geographic region to identify potential differences in the factors associated with sectoral employment patterns. Lastly, Chapter 2 explores the links between sectoral employment shifts, labor productivity and total factor productivity growth in agriculture.

Chapter 3 (Strategic Policy and Foresighting-Downstream Analysis) examines the structure of consumer demand for food, projecting likely changes over the next five years, and linking these consumption changes to changes in future employment. The analysis of Chapter 3 relied on data from household-level LSMS surveys that capture household expenditure on detailed lists of food- and non-food items and employment over the past year of all household members. These data were used to examine current patterns of consumer expenditure and employment, to project the evolution of consumer expenditure over a five-year period and to tie these to employment projections over the same period. LSMS data were complemented by data from Comtrade for imports and exports.

For the Chapter 3 analysis, a common categorization scheme was applied to all food expenditure items, with categories defined by (1) the commodities in the food item and (2) the level of processing, perishability, and source of the item (purchased or own consumption, and whether purchased in prepared form). Once categorized, the food item quantity was allocated across commodities based on content. Chapter 3 conveys five-year projections on consumption and employment, using methods adapted from Tschirley et al. (2015). Demand projections are based on estimates of mid-point arc elasticities of expenditure for each specific commodity categorized by processing/perishability/source, and real annual GDP growth rates for each country. For each food category, the projected total percentage growth over the five year period and its contribution to growth in total demand over all foods were examined, with four categories of food types defined based on their growth profiles. Finally, the Chapter 3 analysis ties the projections of growth in demand to growth in employment through a categorization scheme for jobs that allows direct linking of job categories with the categorization of consumer expenditure explained above.

The Agrifood Landscape Analyses for Rwanda (Chapter 4) and Tanzania (Chapter 5) are based on a comprehensive desktop review of secondary

2 The United Nations classifies individuals between the ages of 15-24 years as youth. However, the African Union and most African countries consider youth to be those within the 15-35 year age bracket. Disaggregating the youth population into the two age brackets allowed us to account for the two definitions.

3 The FTE approach computes the share of an individual's work time over the year that can be allocated to a range of work activities, allowing us to estimate how dependent people are on particular jobs for their livelihood. A full time equivalent of 40 hours a week, 4 weeks per month for a 12-month year period was assumed as one FTE.

data and reports from the World Bank, the United Nations, government and donor agencies, and non-governmental organizations. For each country, the Agrifood Landscape Analysis reviewed population, labor force, and educational characteristics; economic growth and poverty trends; characteristics of the agrifood system, and key policies and programs affecting agrifood system development; and policies and programs related to workforce education and development, and specifically youth training, business development and financial services.

To validate and expand on the findings of the desktop review, AgYees researchers made site visits to Rwanda and Tanzania in December 2015 and February 2016, respectively, to conduct focus group and individual semi-structured interviews with major stakeholders working on youth employment issues related to the agrifood system. Interview guidelines were created following standard academic and international development protocols related to subject matter content, qualitative inquiry techniques, and human subject protection. In each country, the AgYees team conducted interviews with units of the ministries of agriculture, education and other agencies responsible for developing and implementing policies and programs for youth employment in agriculture. The team also met with polytechnic and university providers of formal and informal training for youth and with representatives of international and donor agencies engaged in youth and agriculture programs, as well as NGO, private sector, and state-supported providers of training, business development and financial services for youth. Additionally, the team interviewed key agrifood industry representatives.

KEY FINDINGS

Strategic Policy and Foresighting Analysis

Overall, Chapters 2 (Land/Farm) and 3 (Downstream) convey a consistent story about the major dynamics underway in African employment: labor is moving sharply out of farming as the economies transform, yet farming remains extremely important for livelihoods and economic growth in all these countries. Moreover, the off-farm agrifood system is growing very rapidly in percentage terms and will offer important opportunities for new businesses, but it will not match farming in the absolute level of new job creation for at least ten years. Specific points and insights arising from Chapters 2 and 3 follow.

First, African economies have been transforming rapidly over the past 15 years, with generally rapid but highly variable rates of exit of labor from farming into off-farm segments of the economy. Second, the rate of exit from farming has been most rapid in Rwanda, followed by Tanzania, and Nigeria has shown slow or no exit. The findings on the shift of labor out of farming and differential rates of exit is consistent with the broader literature, including on the negative effects of natural resource booms in Africa on economic transformation.

Third, when computed as full-time equivalents (FTE), the analysis finds that farming (of own farms plus hired farm labor) accounts for 43% to 48% of the labor force in Tanzania, 53% in Rwanda, and 34% in Nigeria. The proportion of the labor force in the off-farm segments of the agrifood system is about 8% in Rwanda, 17% in Tanzania, and 23% in Nigeria in FTE terms. The off-farm sector outside the agrifood system, mainly commerce and transport,

construction and the public sector, employs more: roughly 37% in Rwanda, 35% in Tanzania, and 43% in Nigeria in FTE terms.

Fourth, in terms of new job creation, the chapters both show that employment in the off-farm portion of the agrifood system is growing much more rapidly in percentage terms than employment in farming, but the growth is from a lower base, and thus the contribution to new jobs in off-farm employment is smaller than that of farming.

Fifth, both chapters find that the potential role of the off-farm agrifood system in new employment varies greatly across countries. The off-farm agrifood system will contribute between 18% and 22% of all new FTE jobs in Tanzania over the next five years. This figure is not much lower than farming's 31% to 34% contribution. The off-farm agrifood system currently accounts for 22% to 24% of jobs in Nigeria but only 18% of FTE job growth (half that of farming) due to the lack of exit from farming in that country. On the other hand, the off-farm agrifood system accounts for only 8% of jobs and 11% of job growth (about one-third that of farming) in Rwanda.

The analysis in the two chapters differs on the relative importance of farming in new job creation. Chapter 2 finds that farming has accounted for the largest number of new jobs (compared to the off-farm agrifood system and the rest of the economy outside the agrifood system) in the time period between the two most recent nationally representative surveys in each country. Specifically, Chapter 2 shows that farming contributed 59%, 52%, and 33% of all new jobs created in the economies of Nigeria, Tanzania and Rwanda, respectively. The off-farm agrifood system contributed 40%, 16%, and 11% of all new jobs in the three countries, respectively. The off-farm sector outside the agrifood system accounted for 1%, 32% and 57% of all new jobs in Nigeria, Tanzania and Rwanda, respectively. Both analyses show farming's share of new jobs to be highest in Nigeria and lowest in Rwanda. Chapter 3, however, suggests farming will provide only about one-quarter to one-third of new jobs in the countries, while Chapter 2 suggests a range of one-third to nearly 60%.

A specific and important finding from the Chapter 2 Land/Farm analysis is the demonstration that the pace of economic transformation from farming to off-farm employment is directly related to agricultural productivity growth, consistent with historical patterns of growth in Asia. Rwanda, having experienced the highest agricultural productivity growth among the three focus countries, also has experienced the most rapid decline in the share of the labor force engaged in farming. In contrast, slow agricultural productivity growth in Nigeria has been associated with very little change in farming's share of the labor force. The literature suggests that agricultural productivity growth, especially if broadly based, will generate strong multiplier effects that expand job opportunities in the downstream stages of the agrifood system as well as in the broader off-farm economy.

Agricultural productivity growth can generate strong multiplier effects that expand job opportunities in the broader economy.

Chapter 2's analysis also found that a key constraint to promoting labor productivity growth in farming is access to land, especially in land-scarce regions like Rwanda. Population pressures, increases in world food prices, and associated rising interest in Africa's arable land are driving up land prices in the region, limiting the ability of youth, in particular, to access land.

Key results from Chapter 3's Downstream analysis include, first, that food away from home (FAFH)[4] should generate high quality jobs for youth in all three countries, even if the absolute number of jobs they will support will not be as large as in other sectors. Because the FAFH sectors are much larger in Nigeria and Tanzania than in Rwanda, the former two may present opportunities to focus activities and programming in this sector. This rationale is further supported by the fact that FAFH in these two countries not only offers the most rapid and largest growth in demand of any type of food, but also offers the most rapid growth in output per worker in each country; wages in these sectors (or returns to labor in own employment) are thus likely to be attractive and rapidly improving.

Second, food manufacturing in Tanzania offers the highest output per worker, the second-highest rate of growth in output per worker, and fairly large

4 Food away from home (FAFH) refers to prepared food and beverages purchased for consumption outside the home. In the context of this study, this includes "street food" prepared by informal vendors on roadways or inside traditional markets; traditional alcoholic beverages consumed in the informal locales where they are made, and food purchased from a wide range of formal outlets including fast food restaurants, full-service restaurants, buffets, hotels, and others.

employment absorption, at 5% of all new jobs. In all three countries, results suggest that food manufacturing should offer high quality jobs, but with a much larger number of jobs in Tanzania than in Rwanda and Nigeria.

Third, fresh produce (fruit and vegetables) and dairy offer strong growth prospects for young farmers in Rwanda, from a double perspective: for each, local demand is growing rapidly and export possibilities are strong. Fresh produce could be exported regionally and, if proper investments are made and sustained, internationally to high-income markets. The dairy market in East Africa is already strongly regional and growing rapidly, and Rwanda could be poised to benefit greatly from satisfying some of the growing demand among its much larger neighbors.

Fourth, FAFH stands to benefit women in Nigeria and Tanzania especially, where 90% and 71%, respectively, of all FTE employment in the sector is female.

Finally, the 25-34 year age group is significantly less likely to be engaged in farming than is the 15-24 year group in each country. This pattern suggests that youth may start in farming due to lack of other alternatives, but then look to leave it when they find better options.

AGRIFOOD LANDSCAPE ANALYSIS

Both Rwanda and Tanzania have experienced impressive economic growth during the 2000s. Rwanda's GDP growth averaged eight percent between 2001 and 2014, accompanied by a twenty-point reduction in poverty. Consistent with Chapter 2 findings, Rwanda's economic growth and poverty reduction were in large part due to agricultural policies and investments that resulted in significant improvements in on-farm agricultural productivity which lifted the incomes of rural families. Now, Rwanda's severe land constraints limit further agricultural area expansion and especially youth access to land. A new strategy is required to foster continued economic growth that effectively engages young people and creates not only more jobs, but more productive, poverty-reducing jobs for youth, both on and off the farm.

Unlike Rwanda, Tanzania's economic growth has concentrated mainly in urban areas, driven by capital-intensive sectors, including mining, telecommunications, construction and banking. Except for construction, these capital-intensive sectors create few jobs directly. Also different from Rwanda, the Tanzanian agrifood system's rate of growth has been consistently lower than other sectors, leading to a slower decline in poverty in rural areas, rising inequality between urban and rural populations, and accelerating rural-to-urban migration. Tanzania faces the dual challenge of achieving faster growth while accelerating the shift of its labor force, especially youth, to more productive work. In contrast to Rwanda, Tanzania is well-endowed with natural resources and has significant potential to expand agricultural land. With the recent discovery of large natural gas reserves, together with the expanding mining industry, there will also be opportunities to create agrifood-related jobs and businesses to service the needs of these growing sectors.

Rwanda is attempting to address its youth and productive employment challenge by setting a target of 200,000 new off-farm jobs annually and taking steps to improve the coordination of related employment, skills and finance programs, many with an explicit focus on youth employment. In Tanzania there has been relatively little focused attention on youth employment up to now in national policies and programs. The Government of Tanzania currently does not have a comprehensive coordinated policy on youth skills and employment or an overall employment or youth goal. Where national policies exist, they lack strong implementation and monitoring plans, so impact is uncertain. In both Rwanda and Tanzania, access to land and finance are major constraints for youth opportunities in the agrifood system.

The landscape analysis revealed issues and gaps that must be addressed to elevate youth engagement in the evolving agrifood system as an urgent policy priority in Tanzania and to expand the scale and effectiveness of youth employment and skills training programs in both Rwanda and Tanzania.

Key issues include:

- Agriculture is widely perceived by youth as an unappealing, traditional, labor intensive farm activity which generates little if any profit, not as a potentially high-profit business activity that involves a spectrum of new opportunities on and off the farm connected to marketing, processing, packaging, and food service, in addition to on-farm production. In Rwanda, the policy goal of 200,000 off-farm jobs annually is often interpreted as "non-agricultural jobs" by government representatives and program implementers, even in rural areas, potentially neglecting opportunities to create productive employment for youth with strong growth and poverty implications. Rwanda is an African leader in the application of ICT and other advanced technologies, which are appealing to youth. However, ICT applications which could increase productivity or provide access to finance or market information for the agrifood system are not being strongly promoted.
- There is a significant gap between the skills demanded by the private sector and those supplied by formal programs and informal education and training programs, including specialized technical skills, entrepreneurial/business skills, and soft skills. In general, there is need for a much higher skill level and more systematic, private sector engagement in developing appropriate curriculum for formal and informal courses and providing opportunities for youth to get meaningful practical experience and training.
- Challenges remain in reaching out-of-school, rural youth via informal training, especially expanding the availability of informal training courses that are linked to institutionalized TVET and tertiary systems and are potentially more sustainable. To reach out of work and underemployed youth, non-traditional recruitment strategies are essential. Given the weakness of the agricultural extension service in both countries, the ongoing provision of technical content through informal channels, including associations, agribusiness dealers, and social media is important to keep youth engaged and updated on agricultural innovations and opportunities.
- SME development is a critical lever for connecting skills development and access to financial resources with real economic opportunities that lead to expanded youth employment, in line with agrifood sector comparative and competitive advantage in both countries. Two innovative programs introduced by Rwanda's MINICOM—the Hanga Umuriumo Program (HUP) and Community Processing Centers (CPCs) and sector cluster development—are promising in their efforts to better coordinate training programs provided through different ministries and levels of government, and to link training with access to finance, equipment and other resources. The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) is also facilitating demand-driven cluster development, but without an explicit focus on out of work or underemployed youth.

More systematic private sector engagement is needed to develop appropriate curriculum and provide opportunities for students to get meaningful practical experience and training.

- The experiences of SME and cluster programs in both countries also illustrate the steep learning curve youth entrepreneurs face in starting businesses and responding to market demands on an ongoing basis. The reluctance of financial institutions to lend to young agricultural entrepreneurs and high rates of startup failure suggest the importance of providing a longer-term "safe" incubator environment where young people can learn and practice essential technical and business skills as they are mentored, without the risk of catastrophic failure.
- Youth entrepreneurs engaged in small and medium enterprises (SMEs) and clusters of agrifood system-related businesses and services require assistance to analyze market potential for their products, and to identify and address priority policy and regulatory issues that affect value chain development. Youth also need to be able to access specialized training and assistance to address emerging downstream agrifood business challenges, including meeting local and international food safety standards and developing appropriate, low-cost packaging.
- Although youth and women constitute the rural majority in both countries, few existing analyses examine factors affecting the development of specific value chains using youth as well as gender lenses.

RECOMMENDATIONS

Based on the results of this study, the AgYees team offers the following recommendations for youth-related programming in Rwanda, Tanzania and Nigeria.

	AgYees Recommendations
R1:	**Support action-oriented research and knowledge on strategies and policies that will raise agricultural productivity growth and economic returns to labor in farming, including land tenure and land allocation policies:** Increasing agricultural productivity has the potential to yield broad-based and inclusive growth with significant multiplier effects on off-farm job creation, given historical experience from Asia and the large absolute numbers of jobs that will be created by farming in Nigeria, Tanzania and Rwanda for at least the next decade.
R2:	**Pursue a mixed program strategy to increase youth economic opportunities both on and off-farm:** These programs should (a) increase the knowledge, productivity, and market engagement of youth who have the desire and ability to be good farmers, and (b) provide training and other assistance to increase the profitability of non-farming activities for the many youth who will end up leaving the sector.
R3:	**Focus programming especially on value chains that service the expanding food away from home, food manufacturing, and horticulture sectors:** In Nigeria and Tanzania, farm service provision, on farm production, supply, marketing, processing, wholesaling and retailing of fruits and vegetables, poultry, fish, dairy and high-demand cereals and oilseeds are expected to generate high quality jobs for youth and women. In Rwanda, fresh produce and dairy offer strong growth prospects for young farmers to serve both domestic and regional markets.
R4:	**Develop and implement comprehensive youth employment strategies:** Provide technical assistance and financial resources to enable government to develop (in the case of Tanzania) and fully implement (in both countries) a comprehensive youth employment strategy and implementation plan, with programs coordinated across ministries and levels of government. The programs should include appropriate metrics and monitoring systems. Work with other donors to ensure coordinated funding to implement the strategy.
R5:	**Work to change youth mindsets about agrifood system-related opportunities:** Raise youth awareness about profitable agrifood sector opportunities through multi-media campaigns showcasing agri-entrepreneur role models, new technologies, and exploring business opportunities for youth.
R6:	**Accelerate the application of ICT and other advanced technologies to agrifood system problems:** Ensure that curriculum and informal training courses, including those focused on out-of-school youth, reflect up-to-date technologies. Do this through programs that facilitate collaboration between top universities and polytechnics with private sector associations and other partners to develop, adapt, and disseminate problem-solving innovations. Expand out-of-school rural youth access to technology and engagement through rural Technology Innovation Labs and Service Centers similar to KLab (Kigali).
R7:	**Expand agrifood system training programs and improve curricula:** A persistent low educational and skill level will adversely impact future labor productivity growth and the economic transformation process. In Tanzania, prioritize the expansion of agrifood system training programs in the TVET system and MATIs, targeted especially to out-of-work, underemployed youth. In Rwanda, draw on Rwanda Development Board recommendations on agricultural sector skills needs, accelerate the adoption of competency-based curriculum revisions in support of five agrifood system-related trades with certifications, and expand curriculum revisions to additional agrifood trades.
R8:	**Increase private sector engagement in training programs:** Provide guidelines and resources to educational institutions and non-formal training providers to facilitate regular private sector input to their programs, to review and shape curricula, assist with internship, apprentice and incubator programs, and provide private sector professionals to teach classes and provide content for multi-media programs, focusing especially on out-of-school youth.

	AgYees Recommendations (cont.)
R9:	**Integrate more and higher quality experiential learning in a cost-effective way:** Develop, test, and monitor alternative methods of integrating experiential learning and extended mentoring into skills training and through SME incubators to learn what methods work best to help youth apply learned skills to real employment and entrepreneurship in the agrifood system. Expand the SME cluster incubator concept on farm in high-value agrifood systems, and monitor the outcomes. Work with government, local communities and the private sector to dedicate underutilized land for youth working in groups on intensive, high-potential agriculture enterprises. Work with private sector associations to provide young entrepreneurs and employees with ongoing mentoring and help with solving problems as they arise.
R10:	**Institutionalize monitoring, learning and communication:** Invest in country monitoring and evaluation capacity to continuously learn from program elements that affect learning effectiveness, youth employment, and SME development success. In both countries it will be important to develop appropriate monitoring and evaluation strategies to discern which approaches are more successful than others in transferring experience from the classroom to the real world, which factors affect loan repayment and business success, and why. Develop a common platform for communication and information sharing among youth employment programs.
R11:	**Ensure that SME clusters can access up-to-date training, technologies, and market information, and identify and implement options for addressing policy/regulatory issues:** Provide resources for SME clusters to commission analyses and implement recommendations related to markets and options for addressing policy and regulatory barriers. Ensure that youth can access specialized training and assistance on an on-demand basis to address new downstream business challenges and opportunities, including meeting food safety standards and developing appropriate, low-cost packaging. Ensure access by micro- and small firms in the post-farm segment of the agrifood system to finance, technology, and training.
R12:	**Mainstream gender and youth in all programmatic interventions:** Use data from programs, census and other household and business establishment surveys to track the development of specific priority value chains, their contributions to workforce development and equity as well as economic goals, and determine what program interventions are most effective in improving the participation and success rate of target groups.

CHAPTER 1:

INTRODUCTION

1.1 BACKGROUND

Africa has the youngest population in the world, with almost 200 million people between the ages of 15 and 24—a number that is expected to double by 2045 (African Economic Outlook 2015). Although many jobs have been created by Africa's growing economies, job creation has not been enough to accommodate the growing youth population. The International Labor Organization estimates that of 73 million jobs created in Africa between 2000 and 2008, only 16 million were filled by youth. Sixty percent of Africa's unemployed are youth, even more are underemployed, and youth unemployment rates are double those of adult unemployment in most countries (African Economic Outlook 2015). Across 34 African countries, citizens regard unemployment as the top problem facing their nations (Dome 2015). The rising youth population is increasingly better educated, and there is an unprecedented opportunity for economic and social development if the talents of this generation can be tapped. Alternatively, they could also present a significant threat to social cohesion and political stability if insufficient economic and employment opportunities are available. This is of particularly critical concern in fragile states, with one in two youths joining rebel movements citing unemployment as the primary motivation (World Bank 2011, cited in African Economic Review 2015).

Michigan State University (MSU) designed the Agrifood Youth Employment and Engagement Study (AgYees) in partnership with The MasterCard Foundation to examine the potential of agrifood systems[1] in Rwanda, Tanzania and Nigeria to provide significant levels of new employment for youth. AgYees also assesses constraints that affect the capacity of youth to take up these economic opportunities. Rwanda and Tanzania were mutually selected as the initial AgYees countries, with Nigeria added as a focus country to the Strategic Policy and Foresighting Analysis Track. In each of these countries, 1) youth have great need, there is potential for change, and environments are conducive to reaching and having an impact on youth; 2) the agrifood system is the dominant employer; and 3) MSU has significant experience and relationships. Rwandan, Tanzanian and Nigerian youth aged 15-24 and earning less than $2/day are the focal group for AgYees.

There is an unprecedented opportunity for economic and social development if the talents of this increasingly better-educated generation can be tapped.

1.2 OBJECTIVES

Two complementary analytical tracks within AgYees were designed to inform industry knowledge and The MasterCard Foundation programming. The Strategic Policy and Foresighting Analysis analyzes economic mega-trends for Rwanda, Tanzania and Nigeria, and projects how economic changes, specifically farm structure and dietary transformations, will affect future job prospects for rural and urban African youth. The Agrifood Landscape Analysis focuses on Rwanda and Tanzania and examines the economic and policy environment affecting youth engagement in the agrifood system, the supply and demand for related workforce training, and best practices and lessons learned related to youth economic programming. This two-track effort is intended to provide The MasterCard Foundation with guidance on cost-effective strategies and programmatic entry points most likely to improve employment options and livelihoods for disadvantaged young African men and women.

1 We define the agrifood system as the set of activities, processes, people, and institutions involved in supplying a population with food and agricultural products. The agrifood system encompasses the provision of farming inputs and services, production at farm level, post-farm marketing, processing, packaging, distribution, and retail, and the policy, regulatory, environmental, and broader economic environment in which these activities take place.

Specific objectives for the Strategic Policy and Foresighting Analysis are to identify the anticipated country-specific shifts in the demand for and supply of jobs in particular employment categories in the future; identify the forces that are most likely to influence these outcomes; identify drivers of change in African agrifood systems that will affect these employment trajectories; and assess the implications of these projections for policies and programs designed to support youth employment and livelihoods.

Focusing on Rwanda and Tanzania, the objectives of the Agrifood Landscape Analysis are to review the economic and policy environment affecting youth engagement in agrifood systems, identifying specific opportunities and constraints; identify the workforce training needs of the agrifood industry, the main institutions and organizations now providing agrifood-related workforce training, and perceived gaps; and identify best practices and lessons learned related to youth economic programing, including existing knowledge and learning platforms of relevance to program implementers, policymakers, civil society leaders, industry employers, and youth.

1.3 DATA AND METHODS

1.3.1 Strategic Policy and Foresighting Analysis

The empirical analysis of Chapter 2 (Land/Farm Report) utilizes micro-level data from three sources: the Living Standards Measurement Surveys with its Integrated Surveys of Agriculture (LSMS-ISA), Labor Force Surveys, and the Integrated Public Use Microdata Series, which are based on 10% random samples of national population censes conducted between 1990 and 2010. Each of these data sources had multiple waves of nationally representative surveys for numerous African countries. We focus on labor market information on individual household members, by age, gender, and rural/urban location.

Each of the datasets provided information on respondents' industry of employment coded according to the International Standard for Industrial Classification (ISIC) established by the United Nations Statistics Division. The Chapter 2 analysis covered the working-age population, defined as those individuals between the ages of 15 and 64 years, and focused on the 15 to 35 year age range, disaggregated into two age brackets, 15-24 and 25-35[2]. The working-age population was classified into one of four primary employment categories: farming, off-farm employment (further disaggregated where possible between off-farm employment within the agrifood system and off-farm employment not directly related to agricultural value chains[3]; between public and private sector jobs; and between wage employment and self-employment jobs), the unemployed, and economically inactive. Three main employment categories were studied in Chapter 2: farming, downstream segments of the agrifood system, and off-farm sectors.

From these classifications, employment shares and employment changes over time were computed. Employment is reported both in terms of counts as stated by survey respondents, and by computing "full-time equivalents" (FTE).[4] Employment shares

2 United Nations classifies individuals between the ages of 15-24 years as youth. However, the African Union and most African countries consider individuals in the 15-34 age bracket as youth. Disaggregating the youth population into the two age brackets allowed us to account for the two definitions.

3 "Farming" includes all activities related to growing crops and raising livestock including aquaculture and hunting. Included in the downstream stages of the agrifood system are all post-farm value addition, e.g., assembly trading, wholesaling, storage, processing, retailing, preparation of food for selling to others outside the home, beverage manufacturing, and downstream activities related to cotton production. These activities related to agricultural processing and commerce were classified as off-farm employment within the agrifood system. The third employment category, "off-farm sectors" included all other types of employment not counted above.

4 The FTE approach computes the share of an individual's work time over the year that can be allocated to a range of work activities, allowing us to estimate how dependent people are on particular jobs for their livelihood. A full time equivalent of 40 hours a week, 4 weeks per month for a 12-month year period was assumed as one FTE.

AGRIFOOD SYSTEM:
The set of activities, processes, people, and institutions involved in supplying a population with food and agricultural products.

are also computed in two ways: as a percentage of the entire working age population (including economically inactive and unemployed), and, for the subset of the working age population that was employed, as a percentage of the total number of jobs, taking into account multiple jobs per person.

The Chapter 2 analysis then estimated multinomial logit models to identify the socio-economic, demographic and geographical factors shaping the employment structure over time, building on the work of McMillan and Harttgen (2014). The analysis also disaggregated by geographical region and controlled for gender and age categories, allowing us to identify potential gender, age and regional differences in the factors associated with sectoral employment patterns in both rural and urban areas. Lastly, Chapter 2 explores the linkages between sectoral employment shifts, labor productivity and total factor productivity growth in agriculture.

The analysis of Chapter 3 (Downstream Analysis) relies primarily on data from household-level Living Standards Measurement Study (LSMS) surveys. These surveys capture household expenditure on detailed lists of food- and non-food items, and employment over the past year of all household members. The data are used to examine current patterns of consumer expenditure and employment, to project the evolution of consumer expenditure over a five-year period and to tie these consumer expenditure projections to projections of the evolution of employment over the same period. LSMS data were complemented by data from Comtrade at the 6-digit ISIC level for imports and exports.

A common categorization scheme was applied to all LSMS expenditure and Comtrade data. All food expenditure items as listed in each country's surveys were placed in a matrix defined by (1) the commodities in the food item, and (2) the level of processing, perishability, and source of the item (purchased or own consumption, and whether purchased in prepared form). Once categorized, the food item quantity was allocated across commodities based on its content. Foods with more than one ingredient were allocated across multiple commodity groups based on the estimated quantity share of each ingredient.

Chapter 3 generated five-year projections on consumption and employment, using methods adapted from Tschirley et al. (2015). Demand projections were based on (a) estimates of mid-point arc elasticities of expenditure for each specific commodity categorized by processing/perishability/source and (b) real annual GDP growth rates for each country. For each food category, we examined the projected total percentage growth over the five year period and its contribution to growth in total demand over all foods, to identify four categories of food types based on their growth profile. These were:

- "Best bets": Food groups with a substantial starting level of demand and which are expected to show fast growth, resulting in a large contribution to total demand growth;
- "The steady set": Food groups with a large starting demand footprint but which are expected to show more moderate growth, resulting in a still meaningful contribution to total demand growth;
- "Promising but small": Groups expected to show fast growth but from a small starting base of demand, resulting in a moderate contribution to total demand growth but large opportunities for some firms; and
- "Least promising": Groups exhibiting slow growth and a small contribution to total demand growth. This low contribution could come either from extremely slow growth from a large base, or from moderate growth from a low base.

These projections of growth in demand were tied to growth in employment through a categorization scheme for jobs that allows direct linking of it with the categorization of consumer expenditure explained above. The jobs categorizations that link to the expenditure scheme are based on the ISIC system.

Chapter 3 used the "Structural scenario" approach of Tschirley et al. (2015b), adapted from Timmer (2012). This scenario is based on the long-term relationship between per capita incomes and farming's share in a country's workforce, and rests on the fundamental dynamic of the "structural transformation" of economies, in which households move from low-productivity sectors of the economy (almost always farming in low income countries) to higher productivity sectors, thus improving their own circumstances and at the same time driving broad productivity growth in the economy (Timmer, 1988; see also McMillan and Haartgen, 2014 for recent evidence from Africa). We estimated this relationship individually for Tanzania and Nigeria using time series data for each country from the Groningen Growth and Development Centre Sector Database (Version 2014). Because Rwanda is not included in the database, we set its estimated coefficient equal to the coefficient in a regression on all non-resource rich SSA countries.

Additional detail about data and methods used in the Strategic Policy and Forecasting Analysis can be found in Chapters 2 and 3.

1.3.2 Landscape Analysis

The Agrifood Landscape Analyses for Rwanda (Chapter 4) and Tanzania (Chapter 5) are based on a comprehensive desktop review of secondary data and reports from the World Bank, the United Nations, government and donor agencies, and non-governmental organizations. For each country, the Agrifood Landscape Analysis reviewed population, labor force, and educational characteristics; economic growth and poverty trends; characteristics of the agrifood system, and key policies and programs affecting agrifood system development; and policies and programs related to workforce education and development, and specifically youth training, business development and financial services.

To validate and expand on the findings of the desktop review, the AgYees team made site visits to Rwanda and Tanzania in December 2015 and February 2016, respectively, to conduct focus group and individual semi-structured interviews with major stakeholders working on youth employment issues related to the agrifood system. The stakeholders were selected based on the desktop review as well as in consultation with in-country partners. Interview guidelines were created following standard academic and international development protocols related to subject matter content, qualitative inquiry techniques, and human subject protection. The questions were reviewed by other faculty members, The MasterCard Foundation Scholars, Borlaug Scholars and other Rwandan and Tanzanian students and alumni with experience in the agrifood industry.

In each country, the AgYees team conducted interviews with units of the ministries of agriculture, education and other agencies with responsibility for developing and implementing policies and programs for youth employment in agriculture. The team also met with polytechnic and university providers of formal and informal training for youth. Interviews were conducted with representatives of international and donor agencies engaged in youth and agriculture programs, as well as NGO, private sector, and state-supported providers of training, business development and financial services for youth. Representatives of agrifood sector businesses throughout key agrifood systems, large and small, were also interviewed, including input suppliers, producers, processors, wholesalers and retailers. The interview guidelines and a complete list of the organizations interviewed in Rwanda and Tanzania are included in Annexes 5 and 6.

1.4 ORGANIZATION OF THIS REPORT

The AgYees Report is organized into six chapters. Following this first chapter, Chapter 2 (Land/Farm Report), offers a detailed description of employment trends in the region, focusing on men and women between 15-35 years of age, and examines the role of agricultural productivity growth in promoting job growth in the overall economy. Chapter 3 (Downstream Report) examines the structure of consumer demand for food, projecting likely changes over the next five years, and links these consumption changes to changes in future employment. Chapters 4 and 5 present the Landscape Analyses for Rwanda and Tanzania, respectively. Chapter 6 synthesizes the overall conclusions and recommendations of the report.

PART 1:
STRATEGIC POLICY AND FORESIGHTING ANALYSIS

CHAPTER 2:

LAND/FARM REPORT

Thomas Jayne and Felix Kwame Yeboah

HIGHLIGHTS

- Variable urbanization patterns across countries. Share of urban workforce rising in Tanzania but declining in Rwanda and Nigeria. Over 60% of the youth population (15-24) in all three countries still resides in rural areas.
- Variable demographic and economic transformation patterns across countries. Number of working age (and young people) engaged in farming increasing but the share of the labor force in farming is generally declining except in Nigeria.
- Pace of economic transformation in last decade linked to agricultural productivity growth.
- There are many more jobs opening up for young people in the off-farm sectors outside the agrifood system than in off-farm segments of the agrifood systems. This finding is robust for Rwanda and Tanzania but not Nigeria.
- Downstream agrifood system employment is growing rapidly in percentage terms, but starting from a very low base particularly in Rwanda.
- Off-farm employment is growing at a faster rate in rural areas than in urban areas.
- Farming remains the largest single source of employment for young people and the entire working age population at least for the next decade.
- Most of the new jobs held by the youth (15-24 years) in Tanzania and Nigeria are in farming while in Rwanda most new jobs are generated off farm outside the agrifood system.
- The economically inactive comprise 30% or more of the youth population, reflecting major increases in education and training. Africa's labor force in 2030 will be substantially better educated than it was in 2000.
- Rising rural unemployment particularly in countries (e.g. Rwanda) experiencing rapid declines in farming share of employment. Youth and females are more likely to be unemployed and economically inactive.

2.1 INTRODUCTION

Sub-Saharan Africa has recorded impressive economic growth rates in recent years after a long period of economic stagnation (AfDB et al., 2014; IMF, 2013)[1]. At the same time, Africa's workforce is growing at roughly three percent per year—more rapidly than any other region of the world. Moreover, 60% of Sub-Saharan Africa's population is below the age of 25. Each year over 8 million young Africans are entering the labor market, constituting the majority of the 220 million new people projected to be in the labor force by 2035 (Losch 2012; Fox et al 2013). Africa is one of the few regions of the world where the rural population is still growing; there are projected to be 53% more people in rural areas in 2050 than today (UN, 2016).

Africa's expanding labor force poses both major opportunities and challenges. If investment

1 Six of the world's ten fastest growing economies in the 2000s were in Africa and several African countries recorded GDP growth rates above 5% during the period.

incentives are favorable and opportunities for viable employment are expanding as rapidly as the labor force, Africa's economies may experience rapid transformation with rising living standards. By contrast, if an unsupportive enabling environment chokes off new investment and job opportunities, economic transformation may be accompanied by a rapidly rising but under-employed youth labor force, stubbornly high poverty rates, disillusionment, and potentially social instability. Consequently, evidence suggesting that the economic growth rates recorded in Africa have not been matched with strong wage-job creation raises concerns about the nature and sustainability of economic transformation in the region (Fine et al., 2012, Filmer and Fox 2014). Unsurprisingly, the most recent round of nationally representative AfroBarometer data for 34 African countries cited addressing unemployment as the greatest priority for government action—15 percentage points higher than the next most important perceived priority (Dome, 2015).

In response, youth employment has become an important policy priority in most countries and embedded in the 2030 development agenda. There is also great interest within the donor community including The MasterCard Foundation to identify the sources of productive employment and effective strategies that would promote job creation and economic growth in Africa. However, successful strategies will be dependent on a fundamental understanding of the evolving dynamics of Africa's workforce. Hence, as a contribution to these current policy and research challenges, this chapter documents the employment and demographic shifts among Africa's working-age population with particular attention to the youth, and identifies key socioeconomic factors influencing these trends. It then examines the relationship between agricultural productivity growth, land distribution patterns, and the structure of change in employment throughout the economy. Lastly, it discusses the consequences of these trends for youth employment policies, especially in light of other important economic processes documented by other research.

Chapter 2 is organized as follows: We first describe the data and analytical methods used in this analysis. This is followed by a discussion of results starting with broad trends in demographic and employment shifts among the working age population in various African countries and narrowing it down to youth employment trends in Nigeria, Tanzania and Rwanda. Next, we discuss potential linkages between observed patterns of employment change, and agricultural productivity growth, land allocation patterns and policies in the economic transformation process. The chapter ends with a discussion of the key findings and its implications for policy.

2.2 DATA

Our analysis draws on four data sets: First, the *Africa Sector Database* is utilized as a starting point for understanding broad trends in employment by sector for multiple African countries. This dataset was developed by the Groningen Growth and Development Center. Employment and labor productivity data were derived for particular years from national micro-surveys, and the remaining years were interpolated to arrive at annual data on employment for various sectors between 1960 and 2010.

Our primary empirical analysis utilizes micro-level data from three sources: the Living Standards Measurement Study with its Integrated Surveys of Agriculture (LSMS-ISA), Labor Force Surveys, and the Integrated Public Use Microdata Series (IPUMS), which are based on 10% random samples of national population censes conducted between 1990 and 2010 and managed by the University of Minnesota Population Center.[2] Each of these data sources had multiple waves of nationally representative surveys for numerous African countries. We focus on labor market information on individual household members, by age, gender, and rural/urban location.

Classifications of individuals into employment sectors were based on the respondents' stated industry of employment defined as the activity or product of the establishment or sector in which the person is employed. Each of the datasets provided information on respondents' industry of employment coded according to the International Standard for Industrial Classification (ISIC) established by the United Nations Statistics Division.

Our primary empirical analysis covered nine countries in sub-Saharan Africa: Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Tanzania, Uganda and Zambia. Table 2.1 presents data sources used for each country. However, our discussions in Chapter 2 focus on the three AgYees target countries—Nigeria, Rwanda, and Tanzania.

2 See: https://international.ipums.org/international/

Table 2.1 Countries included in primary analysis

Country	Name of survey	Year collected	Type/source
Ghana	Ghana Living Standard Survey	2005/06, 2012/13	LSMS
Kenya	Population and Housing Census	1999, 2009	Census data from IPUMS
Malawi	Household and Population Census	1998, 2008	Census data from IPUMS
Mali	Quatrieme recensement general de la population et de l'habitat	1998, 2009	Census data from IPUMS
Nigeria	General Household Survey	2010/11, 2012/13	LSMS
Rwanda	Integrated Household Living Survey (EICV)	2005/6, 2010/11	Household data from National Institute of Statistics, Rwanda
Tanzania	National Panel Survey	2010/11, 2012/13	LSMS
Uganda	National Panel Survey	2005/06, 2011/12	LSMS
Zambia	Labor Force Survey	2005, 2012	LFS

Some limitations to the data should be acknowledged. Country surveys differed in the level of ISIC coding detail. As a result, it was possible to clearly categorize individuals into specific employment sectors in some countries but not in others. For instance, sufficient ISIC code detail was available in some countries to enable individuals listed as being engaged in "wholesaling and retailing" to be categorized into the wholesale and retail trade of agricultural commodities vs. wholesale and retail trade of off-farm commodities. However, in some countries this level of detail was not available. In the latter cases, decision rules were created to apportion those specifying "wholesale and retail trade", for instance, into off-farm within agrifood system vs. off-farm industries. For details on the methods used to compute employment shares by sector, see Annex 3.

2.3 ANALYTICAL METHODS

Our analysis covers the working-age population, defined as those individuals between the ages of 15 and 64 years (OECD, 2015), and focuses in particular on those in the 15 to 34 year age range, disaggregated into two age brackets, 15-24 and 25-34[3]. The first step involves the classification of the working-age population into three employment categories: (i) farming, (ii) off-farm within agri-food system (upstream and downstream), and (iii) off-farm outside agri-food system. These employment categories were further disaggregated between self-employment and wage employment, and between public and private sector jobs. The employment category *farming* includes all activities related to growing crops and raising livestock including aquaculture and hunting. The off-farm portion of the agri-food system is comprised of all pre- and post-farm value addition activities within the agricultural value chains including assembly trading, wholesaling, storage, processing, retailing, preparation of food for selling to others outside the home, beverage manufacturing, farmer input distribution and irrigation equipment operators, etc. The third employment category, *off-farm sectors outside the agri-food system*, included all other types of employment not counted above. This employment classification scheme allowed us to estimate the relative size and job growth in the agrifood system[4], which is envisioned to be a major vehicle for economic transformation (Filmer and Fox 2014, Tschirley et al., 2015). We focused on the usual employment of respondents, defined as the economic activity during the past 12-month period, enabling us to account for the seasonal effects of employment arising from fluctuations in labor demand and employment during the year.

We also created two additional economic activity categories following the definition of the International Labor Organization (ILO 1982): (iv) the unemployed and (v) the economically inactive. The unemployed category is comprised of individuals without a job and not engaged in any economic activity during the reference period, available to work, and either looking for employment or not seeking employment because they thought no work

3 United Nations classifies individuals between the ages of 15-24 years as youth. However, the African Union and most African countries consider individuals in the 15-34 age bracket as youth. Disaggregating the youth population into the two age brackets allowed us to account for the two definitions.

4 Agrifood system comprises the set of activities, processes, people, and institutions involved in supplying a population with food and agricultural products

was available.[5] The economically inactive category was made up of individuals who were not engaged in any economic activity during the set period and are neither looking for work nor available to work for various reasons.

From the classifications, employment shares and employment changes over time are computed. We report employment both in terms of counts as stated by survey respondents, and by computing "full-time equivalents" (FTE). The FTE approach computes the share of individual's work time over the year that can be allocated to a range of work activities, allowing us to estimate how dependent people are on particular jobs for their livelihoods. A full-time equivalent of 40 hours a week, 4 weeks per month for a 12-month year period was assumed as one FTE. Employment shares are also computed in two ways. First, we compute employment shares as a percentage of the entire working age population (including economically inactive and unemployed). This computation accounts for only the primary source of employment for those individuals that were employed. Second, for the subset of the working age population that was employed, employment shares are computed as a percentage of the total number of jobs, taking into account multiple jobs per person.

The next step in our analysis involves estimating multinomial logit models (unit of observation is an individual of working age between 15-64 years) to identify the socio-economic, demographic and geographical factors shaping the employment structure over time, building on the work of McMillan and Harttgen (2014). Our analysis is also disaggregated by geographical region, and controls for gender and age categories, allowing us to identify potential gender, age and regional differences in the factors associated with sectoral employment patterns in both rural and urban areas. Lastly, we explore the linkages between the sectoral employment shifts, labor productivity and total factor productivity growth in agriculture.

2.4 RESULTS AND DISCUSSION

2.4.1 Urbanization and demographic shifts among the working age population

Africa's urban population is growing rapidly, but the rate at which the region is urbanizing is in fact slowing down (United Nations, 2016). In the 1960s, 1970s and 1980s, massive rural-to-urban migration fueled rapid growth in Africa's urban population and this was accompanied by high rates of urbanization (the percentage of the total population residing in urban areas). However, since 2000, and despite considerable country-specific variability, a major under-appreciated demographic fact is that Africa's urban population growth for at least the past decade is mainly due to natural growth of urban population (birth rates minus death rates of people residing in urban areas) (Bocquier, 20105; Potts, 2012; 2014; UN 2016).[6] While rural-to-urban migration continues, it appears to have slowed down considerably in most of sub-Saharan Africa. Some scholars contend that most migration in the region is rural-to-rural, with young people accounting for most of it (Bilsborrow, 2002). Potts (2009) observed slowing levels of urbanization in some parts of Africa partly due to circular migration of people between urban and rural areas in response to growing economic hardship in urban centers, where rates of income growth are outpaced by the increasing cost of living. Potts (2014) argues that the price of low-income housing in urban areas will be a major determinant of future rate of urbanization in the region. Therefore, to the extent that national conditions and policies differ across countries, with respect to relative expected earnings and costs of living in urban and rural areas, we would expect to see cross-country differences in sectoral employment trends associated with differential rural/urban population growth patterns.

5 By ILO (1982) definition, an individual cannot have worked for even one hour on any economic activity including household enterprises during the reference period and should actively be looking for work to be classified as unemployed.

6 Sub-Saharan African countries are urbanizing at different rates. For instance, while over 50% of people in Ghana, Angola, and Cape Verde live in urban areas, the share of the urban population in a number of countries (e.g. Niger, Uganda, Malawi, Rwanda, Ethiopia, Burundi) is still less than 20%.

Table 2.2 Changes in number of working age population over time by locality

	Ghana 2005-2013	Kenya* 1999-2009	Malawi* 1998-2008	Mali* 1998-2009	Nigeria **2011-2013**	Rwanda **2006-2011**	Tanzania **2011-2013**	Uganda 2006-2012	Zambia 2005-2012
Total # of working age individuals (15-64) in base year	12,531,725	14,979,080	5,195,510	4,957,820	**85,559,756**	**5,075,138**	**23,629,262**	13,779,475	6,236,683
% of working age in urban area	41.7	28.2	16.0	29.4	**40.6**	**17.7**	**30.4**	20.0	39.6
% of working age in rural area	58.3	71.8	84.0	70.6	**59.4**	**81.3**	**69.6**	80.0	60.4
Total # of working age individuals (15-64) in end year	14,679,955	20,543,290	6,802,300	7,021,500	**89,075,132**	**5,795,397**	**24,113,058**	16,027,014	7,478,049
% of working age in urban area	53.4	36.0	17.5	26.0	**38.8**	**16.2**	**31.1**	18.8	44.6
% of working age in rural area	46.6	64.0	82.5	74.0	**61.2**	**83.8**	**68.9**	81.2	55.4
Annual % change in # of working age individuals from base to end year	2.1	3.7	3.1	3.8	**2.1**	**2.8**	**1.0**	2.3	2.8
Urban	6.3	7.5	3.6	2.3	**-0.2**	**0.9**	**2.2**	2.0	5.0
Rural	-0.8	2.2	2.9	4.4	**3.6**	**3.6**	**0.5**	2.4	1.4

Source: Authors' estimates from Ghana Living Standard Survey 5 and 6; Zambia labor force surveys 2005 and 2012; Rwanda Integrated Household Living Survey; Tanzania National Panel Survey; Uganda National Panel Survey; General Household survey.
**Microdata of population and housing census data in IPUMS*

Table 2.2 presents the number of working-age individuals in the base year and the year of the most recent nationally representative surveys. Specific survey years are listed on the top column of Table 2.2. Several surprises emerge from the data. First, the conventional view of a rising percentage of the working age population residing in urban areas is borne out in only five of the nine countries examined (Ghana, Kenya, Tanzania, Malawi and Zambia). The urban share of the working age population is increasing in Tanzania but declining in Nigeria and Rwanda. In Nigeria, the share of working age population in urban areas declined by 1.8% over a two-year period while that in Rwanda declined by 1.5% within the 5 year period. Analogously, the working-age population in urban areas is growing at a faster rate than in rural areas in Tanzania while the rural work force is actually growing more rapidly in Nigeria, and Rwanda[7]. We must therefore acknowledge highly variable patterns across these countries in the pace of urbanization and rates of expansion of the urban and rural labor force. This conclusion is in accord with Potts (2013), who cautions against overgeneralization about rapid urbanization and shifts in the locus of job growth in the region. This pattern of growth in rural workforce is also replicated among young people (15-34 years) in Rwanda and Nigeria. Even in Tanzania, where the share of working age population and young people in the 25-34 age bracket residing in urban areas is increasing, the share of youth population (15-24 years) living in urban areas is declining (See Tables 28 and 2.9). And the share of youth population (15-24) living in rural areas remains high in all three countries—Nigeria (62%), Tanzania (70%) and Rwanda (83%). Although urbanization is expected to continue, it appears that the majority of the youth (15-24 years) who may be seeking employment in all three countries may still come from rural areas.

7 Rural-urban classification of both surveys in Rwanda are based on the corresponding geographical designations from the 2002 Rwanda Census of Population and Housing. Hence, the estimated total urban population for the 2010/11 survey data does not reflect the expected urban expansion of the population

2.4.2 Employment structure among the working age population

Structural change—the reallocation of economic activity away from less productive sectors of the economy to more productive ones—has long been considered a fundamental driver of economic

development (Timmer 2009; Barrett et al., 2010; Duarte and Restuccia, 2010; McMillan et al, 2014). Both in theory and actual experiences of currently developed countries, movement of labor from low-productivity semi-subsistence agriculture to more productive manufacturing and service sectors has generally been associated with overall increases in productivity, living standards and poverty reduction. Countries in the early stages of development typically devote a disproportionate share of their abundant labor to traditional agriculture. Productivity growth in agriculture accumulates additional purchasing power among millions of rural families that generates powerful multiplier effects on the rest of the economy, expanding job opportunities in off-farm sectors and thereby releasing labor to off-farm sectors. Consequently, reduction in the share of the work force in agriculture is generally associated with success of the agricultural sector in setting in motion the initial stages of economic transformation. In this section, we examine the extent to which these familiar patterns are playing out in the region.

Second, we use nationally representative household-level data to further explore the evolving employment structure in Nigeria, Rwanda and Tanzania. With urbanization and rising incomes reportedly driving a dietary transformation in urban areas of Africa, the agrifood system is envisioned as a major vehicle for achieving economic transformation in the region (Filmer and Fox 2014, Tschirley et al., 2015). In fact, Tschirley et al (2015) projects that the percentage of employed people located in the downstream stages of African food systems will rise from eight percent of total employment in 2010 to 12% or more by 2025, and that 17% of all new jobs created in the economy over this 15 year period may be in these downstream stages of the agrifood system (retailing, processing, food preparation away from home). To determine the relative size and contribution of the agrifood system to employment growth in the three countries, our primary analysis focuses on three employment categories—farming, the off-farm segment of the agrifood system (downstream and upstream), and off-farm outside the agrifood system. The results of both analyses are presented below. We first present broad patterns in sectoral employment across Africa using the GGDC Africa sector data followed by the findings from our primary analysis.

2.4.2.1 Broad sectoral employment trends across Africa

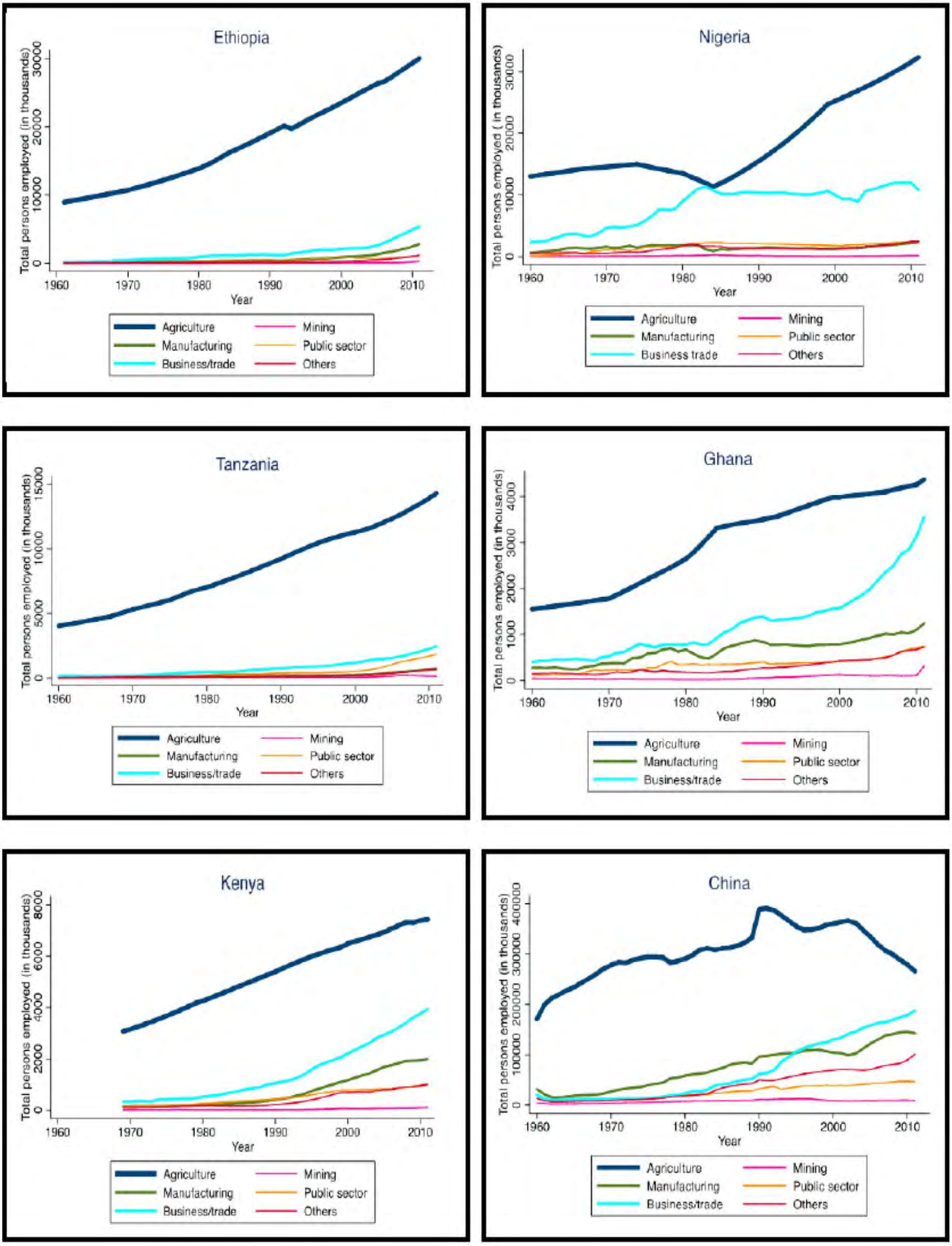
Figure 2.1 reports trends in employment across industrial sectors in select African countries and China using the GGDC Africa sector data. An important observation from the figure is an increasing trend in the number of people engaged in primary agriculture[8] among the African countries. Compared to China, where the agricultural labor force peaked around 1990 and has since declined, each of the African countries examined is still experiencing increases in the number of people involved in primary agriculture over time (Figure 2.1). The dominance of agriculture as the key employment sector is also apparent even in terms of shares in total employment. For instance, in 2011, agricultural employment accounted for about 62% and 71% of total employment in Nigeria and Tanzania respectively (Figure 2.2). However, the share of agricultural employment is generally declining over time in most countries in line with the findings from many previous studies using different datasets (Proctor and Lucchessi 2012; de Vries et al., 2015; Sackey et al. 2012). This decline is particularly pronounced post 2000 but with some variations across countries. As shown in Figure 2.2, Tanzania experienced a steady decline in agriculture's employment share over time with more rapid declines occurring after 2000. Conversely, Nigeria experienced an increase in the share of agricultural employment from 48% in 1980 to about 64% in 2000. It is only after 2000 where a slight decline of about two percentage points in agriculture employment shares was recorded (Figure 2.2). There is thus the need for caution against overgeneralization of employment trends across Africa. For most countries, the reallocation of labor from agriculture appears to have benefited primarily the service-sector activities like commerce and hospitality sector instead of manufacturing sector. Also, while growing rapidly in percentage terms, results from the GGDC database shows that growth in employment in each of the non-agricultural sectors has started from a relatively low base with little indications of eclipsing agriculture as the single largest source of employment at least over the next few decades.

2.4.2.2 Economic activity status of working age population

The trends observed from the GGDC Africa sector data are reasonably consistent with the results of our primary analysis of employment structure of the working-age population using nationally representative household data. Table 2.3 presents

8 Agriculture is defined in the traditional sense to include crop and livestock production, hunting and related services, forestry and logging and fishery and aquaculture.

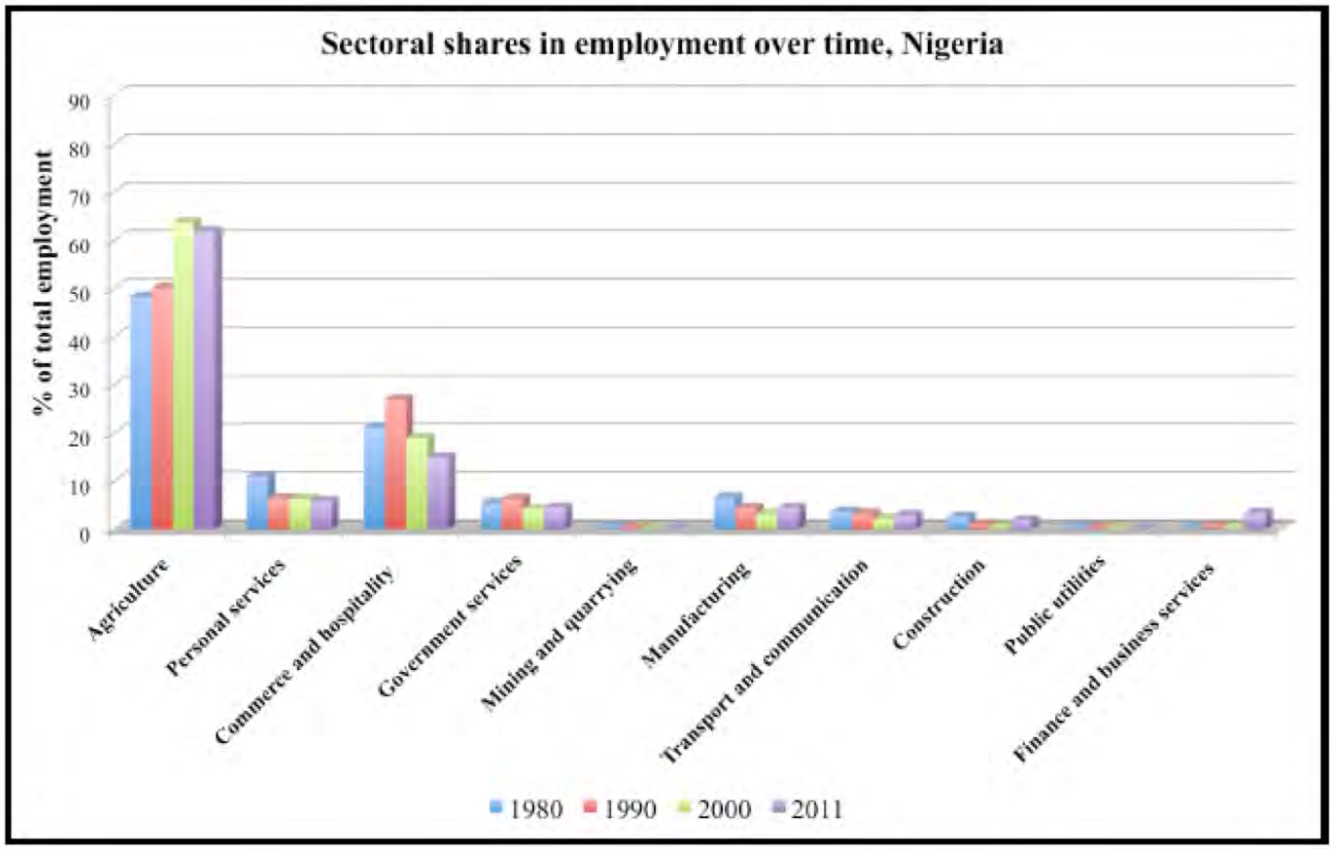
Figure 2.1 Trends in sectoral employment in various countries

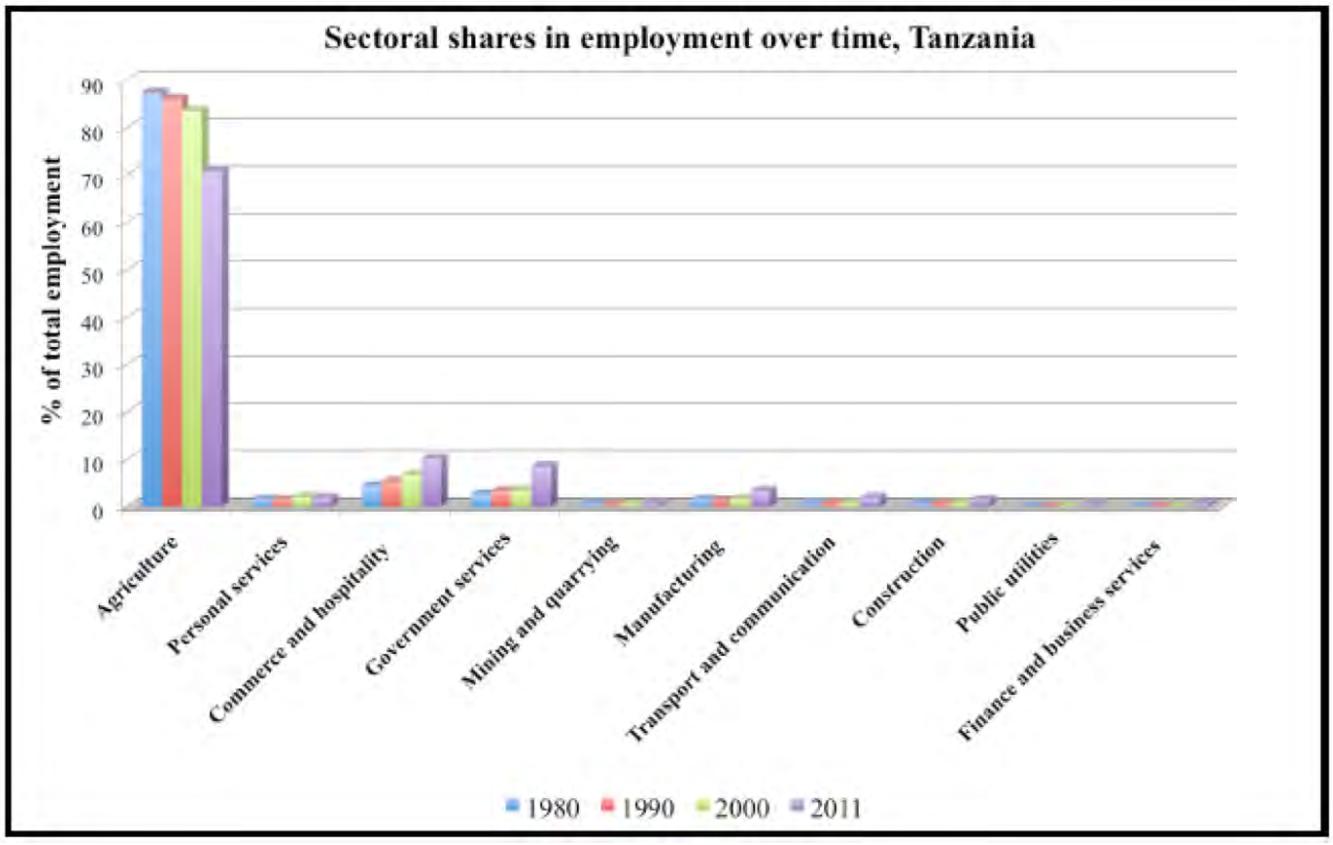


the share of the working age population primarily engaged in the various economic activity from the most recent nationally representative survey both in terms of absolute numbers and full-time equivalents. Generally, the share of working-age population primarily engaged in farming in terms of FTE is lower than that in total number of people in absolute terms. In Rwanda, about 55.4% of the working age population are primarily engaged in farming in absolute terms but only 37.2% in terms of FTEs. Correspondingly, FTE-based employment shares in the off-farm sector were generally higher. The relatively lower share of farming in FTE terms reflects the seasonal nature of farming in the three countries.

The results from Table 2.3 also confirm the role of farming as the largest economic activity in all three countries. About 55.4% of working age individuals in Rwanda, and 51.2% in Tanzania and 27.3% in Nigeria are primarily engaged in farming. With the exception of Nigeria where a relatively high rate of economic inactivity is observed, the second largest share of working age population is primarily engaged in off-farm employment outside the agrifood system. This sector accounts for nearly 25% (30% in FTE) of the working age population in the three countries. The off-farm segment of the agrifood system accounts for less than 15% of the working age population and is particularly small in Rwanda—13.3% (14.1% in FTE) in Nigeria, 12% (14% in FTE) in Tanzania; and 5% (6.9% in FTE) in Rwanda. Between 11% in Tanzania and 33% of the working age population are economically inactive. Unemployed individuals account for less than 3% of the working age population in the three countries. The low levels of unemployment could be explained by the fact that most Africans of working age have no access to social protection schemes like unemployment compensations and hence cannot afford not to work. They thus fill their time participating in low productivity activities or as unpaid family labor even if it pays them well below market wages (Fox et al., 2013; Field 2015). Unemployment becomes more of challenge as income rises and a greater share of enterprises become formalized. The share of working age individuals engaged in farming is generally higher in rural areas while off-farm employment, unemployment and economic inactivity are more pronounced among urban residents. It is important to note that the distribution of the working age population across the economic activity categories is generally robust whether economic activity status is computed as counts or as FTEs. Only in Nigeria do we observe the off-farm sector outside the agrifood system overtaking farming as the dominant employment category in FTE terms among the working age population.

Figure 2.2 Sectoral shares in employment over time, Nigeria and Tanzania from GGDC[9]





9 No data available for Rwanda

Table 2.3 Economic activity status of the working age population (15-64 years) from most recent nationally representative survey

		Total working age population (millions)	% of working age population primarily engaged in									
			Farming		Off-farm stages of agrifood system		Off-farm outside agrifood system		Economically inactive		Unemployed	
			% in counts	% in FTE	% in counts	% in FTE	% in counts	% in FTE	% in counts	% in FTE	% in counts	% in FTE
Nigeria (2012/13)	**Total**	**89.6**	**27.3**	**21.1**	**13.3**	**14.1**	**24.2**	**26.9**	**33.1**	**35.7**	**2.1**	**2.2**
	Rural	54.3	40.9	33.7	11.7	12.2	14.5	16.4	31.9	36.5	1.0	1.2
	Urban	35.3	6.4	4.5	15.8	16.7	39.0	40.8	35.1	34.4	3.7	3.6
Rwanda (2010/11)	**Total**	**5.8**	**55.4**	**37.2**	**5.0**	**6.9**	**21.2**	**29.9**	**17.7**	**24.9**	**0.8**	**1.1**
	Rural	4.8	61.6	44.6	4.4	5.9	16.7	23.2	17.1	25.9	0.2	0.4
	Urban	1.0	23.0	11.2	8.2	10.4	44.3	53.5	20.7	21.1	3.7	3.8
Tanzania (2012/13)	**Total**	**23.5**	**51.2**	**39.2**	**12.0**	**14.0**	**23.3**	**27.9**	**11.7**	**16.4**	**1.8**	**2.5**
	Rural	16.2	67.0	60.4	9.1	9.9	16.1	17.0	7.2	11.8	0.6	0.9
	Urban	7.3	16.2	8.2	18.5	19.9	39.2	43.9	21.5	23.0	4.6	4.9

Source: Authors' estimates from Tanzania National Panel Surveys (2012); Nigeria General Household Survey (2012/13), Rwanda Integrated Household Living Survey (EICV3)

2.4.2.3 Sectoral employment shifts among the working age population over time

We also estimated the changes in employment patterns over time. Using the last two surveys for each country, annual growth rates and the relative shares in total number of jobs of each employment sector are computed. Table 2.4 shows how total jobs are apportioned among farming, off-farm jobs within the agrifood system, and off-farm sectors (outside the agrifood system), both in terms of absolute number of jobs and full-time equivalents over time. Generally, while the number of jobs in farming is increasing in absolute terms in all three countries, farming's share of total jobs is generally changing over time, with variations across the three countries. Like most African countries, Rwanda experienced a rapid decline of about eight percentage points (11 in FTE) in farming's share of total jobs between 2006 and 2011. This decline in farming share of jobs corresponds with an equally rapid percentage growth in the share of off-farm jobs outside the agrifood, while the off-farm segment of the agrifood system stagnated over time. Interestingly, the same period also saw a rapid rise in unemployment, particularly in rural areas, where farming is dominant. This may be indicative of the inadequacy of the off-farm sector to absorb excess labor from farming. Historically, farming has served as a safety valve for the rural workforce. However, in recent times as observed by some scholars (e.g. Bezu and Holden, 2014b) land scarcity arising from population growth and other factors is limiting farming opportunities especially for the youth.

Tanzania, on the other hand, recorded minimal changes in its employment shares over the two-year period studied. Despite a general increase in total number of jobs, the share of total jobs in all the three employment sectors appears to have stagnated over time. For instance, farming share in total number of jobs remained unchanged during the period, although its share in FTE increased slightly. The observed minimal transformation in Tanzania may possibly be due to the short period studied and the fact that panel data were used.

In Nigeria, the share of total jobs from farming rose rapidly in both rural and urban areas for the 2010 to 2013 period. Correspondingly, the share of working age people in off-farm employment outside the agrifood system declined during the period while the share of total jobs increased in the off-farm segment of the agrifood system. The observed employment pattern in Nigeria is consistent with previous studies and potentially reflects the negative effect of the natural resource boom on economic transformation (McMillan and Harttgen (2014). A steady growth in the oil sector in the 1960s, and the subsequent "oil boom" in the 1970s in Nigeria served to draw labor away from agriculture into primarily the service–related sectors of the economy. However, with the decline in oil prices and the associated debt crisis in the 1980s, the Nigerian economy was unable to

Table 2.4 Changes in sectoral share of total jobs among working age population (15-64 years) over time

Country	Survey years	Total # of jobs in millions	Farming		Off-farm within AFS		Off-farm outside AFS	
			% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs
Nigeria	2010/11	62.3	37.0	30.6	18.6	21.2	44.4	48.2
	2012/13	69.7	42.1	33.7	21.1	23.2	36.9	43.1
Rwanda	2005/06	6.1	75.2	65.7	6.8	7.8	18.0	26.6
	2010/11	9.1	67.4	54.0	6.8	8.9	25.9	37.0
Tanzania	2010/11	18.4	59.2	47.3	14.0	17.5	26.8	35.2
	2012/13	20.4	59.2	48.3	13.9	17.2	26.9	34.5

*Source: Authors' estimates from Tanzania National Panel Surveys (2012); Nigeria General Household Survey (2012/13), Rwanda Integrated Household Living Survey (EICV3) *AFS represents the agrifood system.*

support these off-farm economic activities, whose growth was largely dependent on the oil revenues, resulting in a reallocation of labor towards agriculture since the 1980s. Sackey et al., (2012) highlights increased public investment in agriculture in the 2000s, particularly in Nigeria's rural areas, as part of the effort to stem rural-urban migration. These renewed public investments in the agricultural sector, following decades of neglect under an oil-sector-driven economy, might have drawn labor into farming. Note also that, during the period considered in this analysis, Nigeria experienced rapid growth in the working age population in rural areas where off-farm employment opportunities were relatively few and the number of jobs in farming were rising rapidly. The rise in farming share of jobs in Nigeria is associated with a significant decline in unemployment among the working age population, particularly in rural areas.

An examination of job growth rates across employment categories reveals that growth in farming jobs is particularly pronounced in urban areas, where it is generally rising more rapidly than the growth in the working age population in all three countries. This result may be influenced partly by the reclassification of localities from rural to urban once a threshold number of households is exceeded. It may also reflect an increasing engagement of urban dwellers in farming, either as a strategy to cope with rising food insecurity and the cost of living in African cities, or as an investment. Moyo (2015) describes how urban farming is mushrooming in African cities and towns with an associated scramble for unoccupied land in urban and peri-urban areas for food crop and/or livestock production. Jayne et al. (2015) also show that urban households control 15-45% of the land on farms over 20 hectares in size, suggesting a growing proportion of urban-based "investor farmers" in many African countries. Nonetheless, the rate of job growth in farming in urban areas is starting from a very low base relative to rural areas, where the growth rate of employment in farming is generally slower than the rate at which the working age population is growing. Conversely, off-farm employment both within and outside the agrifood system is growing at a more rapid pace in rural areas than in urban areas in the three countries, albeit from a low base, and may suggest increasing rural dynamism and growth linkages between farming and off-farm activities.

A further examination of the composition of jobs in the off-farm segment of the agrifood system reveals that the bulk of job growth in this sector is concentrated in wholesale and retail activities, with less from agro-processing. This observation is perhaps reflective of the continent's rising dependence on food imports. Evidence from FAO suggests that a rising share of Africa's growing demand for semi-processed, processed and high value foods is increasingly being supplied through imports. Estimates of exports of grains (rice, maize and wheat) across the various regions of Africa also revealed the continent as a net importer of grains (Figure 2.3). Hence, while trading in imported grain and value-added agricultural products seems to be boosting employment in the wholesale and retailing sector, the pattern of trade in Figure 2.3 suggests that employment prospects arising from agricultural processing have not been fully realized, as potential gains in job creation from this sector are increasingly being lost to overseas suppliers. A recent FAO report explains the slower transformation in the agro-

processing sector in Africa, which is characterized by a dualistic structure (Hollinger and Staatz, 2015). The report noted that growth among the more dynamic large-scale industrial processors is usually impeded by a general lack of reliable supply of local raw materials of consistent quality, resulting in a reliance on imported grain inputs. A large part of processing of domestically produced food products (especially those based on domestic staples) is still in the hands of small-scale, largely informal-sector operators, who are associated with low productivity and outputs of variable quality (Hollinger and Staatz, 2015). Employment growth in the off-farm stages of the agrifood system will depend on the extent to which local agri-businesses and processors can be equipped to source food from domestic production sources to meet the increasing demand for food in African cities. Job growth in agri-input supply and farm service delivery will also greatly depend on the growth of local farm production. Farm production growth will remain a crucial source of broader economy-wide multiplier effects (Mellor, 1976; Johnston and Kilby, 1975; Lipton, 2005).

2.4.2.4 Sectoral shares of new jobs among the working age population

Table 2.5 presents the shares in new jobs in both counts and FTEs across employment categories. The total number of new jobs is computed as the number of jobs in the second survey year minus the number in the first survey year. Despite the rapid percentage growth in the share of total employment, the off-farm sector, including the downstream stages of the agrifood system, appears to be growing from a low base. Hence, farming still remains the largest source of new jobs in the three countries. As shown in Table 2.5, about 51.6% of the total number of new jobs in Rwanda, 59.1% Tanzania and 84% in Nigeria come from farming. The off-farm sector outside the agrifood system constitutes the next largest source of new employment, accounting for about 41.8% and 27.5% of the new jobs in Rwanda and Tanzania, respectively, but the number of new jobs generated in this sector in Nigeria declined between the two survey periods (-25%). The off-farm segment of the agrifood system contributed about 6.6% in Rwanda, and 13.4% in Tanzania. However, this sector appears to be the main source of off-farm employment in Nigeria, contributing about 41.2% to the total number of new jobs.

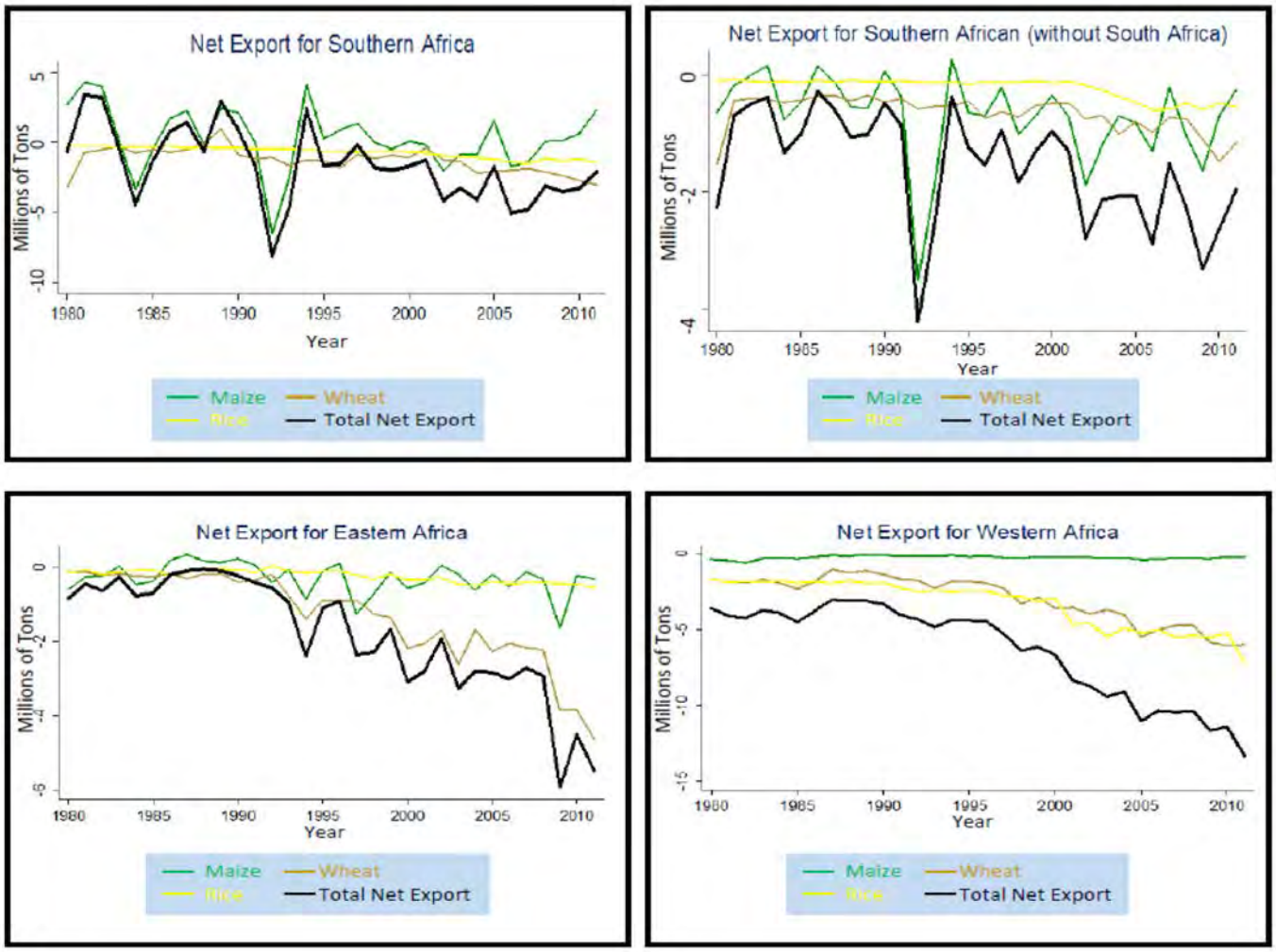
The relative contribution of the various employment categories to new jobs is robust when new jobs are computed in terms of FTEs for Nigeria and Tanzania, but not in Rwanda. The largest share of new FTE jobs in Rwanda is coming from the off-farm sector (outside the agrifood system). It is also important to acknowledge the variability in the sources of employment across countries. The observed dominance of farming in new employment in Nigeria, Tanzania and Rwanda is not replicated in all countries. The largest share of the total number of new jobs in the remaining six countries in our larger exploratory study comes from the off-farm sector outside the agrifood system. While the off-farm sector is expected to eventually contribute a greater number of new jobs, in line with historical patterns of structural transformation, it appears that the three focus countries, particularly Nigeria and Tanzania, have yet to make that transition.

Table 2.5 Sectoral shares of new jobs for the working age population

Country and survey years		Total # of new jobs	Farming		Off-farm within AFS		Off-farm outside AFS	
			% in count	% of FTE	% in count	% of FTE	% in count	% of FTE
Nigeria 2010/11-2012/13	**Total**	**7,386,564**	**84.6**	**58.8**	**41.2**	**40.1**	**-25.8**	**1.2**
	Urban	1,512,289	32.8	-100.2	64.2	232.9	3.1	-32.7
	Rural	5,874,275	97.9	1306.7	35.3	166.8	-33.2	-1373.5
Rwanda 2005/06-2010/11	**Total**	**2,999,869**	**51.6**	**32.5**	**6.6**	**11.1**	**41.8**	**56.5**
	Urban	283,086	43.2	12.8	2.6	9.7	54.2	77.5
	Rural	2,716,783	52.4	36.3	7.1	11.3	40.5	52.4
Tanzania 2010/11 - 2012/13	**Total**	**1,963,982**	**59.1**	**52.1**	**13.4**	**16.0**	**27.5**	**31.9**
	Urban	835,034	39.0	9.9	24.2	32.0	36.8	58.1
	Rural	1,128,948	74.0	80.0	5.4	5.3	20.6	14.5

Notes: Total number of new jobs is computed as the number of jobs in the second survey year minus the number in the first survey year. Jobs from all sources are taken into account. Rows sum to 100%. Source: Authors' estimates based on Tanzania National Panel Surveys; Nigeria General Household Survey (2012/13), Rwanda Integrated Household Living Survey (EICV3)

Figure 2.3 Trends in grain export from Africa by region



2.4.3 Employment structure among youth and young adults

Slightly over 60% of sub-Saharan Africa's population is below the age of 25. Policymakers and development scholars increasingly recognize the importance of young people to growth prospects, sustainable development and social cohesion. The youth bulge-related demographic dividend is estimated to have accounted for about a third of the rapid economic growth among East Asian nations (Christiaensen and Devarajan, 2013). The comprehensive study of Africa's youth bulge and ensuing demographic shifts by Filmer and Fox (2014) indicate that over the next several decades the agrifood system and the informal sector are going to be called upon to absorb rural youth for employment, especially in light of the poor performance of manufacturing. With the youth constituting the largest share of the population in most African countries, youth employment has become a major policy priority in the region's quest to reap a demographic dividend. We therefore explore the dynamics in labor force among the young people focusing primarily on Nigeria, Rwanda and Tanzania.

From a statistical perspective, the United Nations classifies individuals between the ages of 15-24 years as youth, compared with the African Union definition of 15-34 years, which has been adopted by national youth development programs in some African countries. Hence, to account for the two definitions of youth, we classify our youth population into two categories: individuals aged 15-24 years, whom we refer to as the "youth" in the traditional sense, and individuals aged 25-34 years, hereto referred to as "young adults". There is some merit in doing so. Considering that the majority of individuals within the 15-24 year age bracket tend to reside with their parents or are still dependent on their parents for their sustenance (Bezu and Holden, 2014a), their current employment situation would more likely be reflective of their parents' labor allocation decisions. The 'young adult' category offers some additional insights into young peoples' employment prospects when they are relatively less dependent on their parents.

2.4.3.1 Economic activity status of youth and young adults

Table 2.6 presents results from an analysis of the primary economic activity of youth and young adults in the three countries. The first striking observation is the huge share of the total working-age population that is accounted for by individuals in the 15-24 year age category. In each country, people in the 15-24 year age category account for at least a third of the total working-age (15-64 year) population. In Nigeria, for example, there are 31.2 million people in the 15-24 year age category, representing about 35% of the entire working age population. In Rwanda and Tanzania, the youth constitute about 39.6% and 39.4% of the working age population respectively. Young adults also account for at least an additional one-fourth of the working age population in each country. Together, the two age categories constitute about 58% of the working age population in Nigeria, 63% in Tanzania, and 66% in Rwanda.

With 15-24 year-olds constituting the largest share of the population in most African countries, youth employment has become a major policy priority in the region's quest to reap a demographic dividend.

Second, we find that, among young people, farming remains the single largest source of employment. About 21.4% of the youth in Nigeria, 47% in Rwanda, and 51.4% in Tanzania are engaged in farming. When considering only those employed, about 61.1% (50.8% in FTE) of the jobs held by the youth (15-24) in Nigeria, 65.1% (50% in FTE) Rwanda, and 69.6% (60 in FTE) in Tanzania are in farming (Table 2.7). The dominance of farming is also mirrored among the young adults (25-34 year age category). With the exception of Nigeria, where the off-farm sector outside the agrifood system accounts for the largest share of employment, over 40% of young adults in the remaining countries are primarily engaged in farming (Table 2.6). About 62.7% and 46.1% of young adults in Rwanda and Tanzania are in farming. The farming share of total employment is generally lower among the young adults relative to the youth. For instance, from the most recent surveys, about 33.4% (26.2% in FTE) of the jobs held by young adults in Nigeria, 49.7% (41.2% in FTE) in Tanzania and 64.1% (49% in FTE) in Rwanda are in farming. Related, over 60% of the jobs held by the youth (15-24) that are active in the labor force in all three countries are in farming. These individuals are perhaps out-of-school youth with few skills and little experience, helping their parents on the farm as unpaid family labor. Previous studies indicate the youth often aspire to careers outside of agriculture (Bezu and Holden (2014). It is thus possible that youth are starting out in farming perhaps because

their parents are farmers, but eventually transition into off-farm employment in their young adult years. There are gender differences, with a somewhat higher proportion of youthful (15-24 years) males being engaged in farming than females, except in Rwanda. However, this trend is reversed among young adults, where a larger proportion of females than males are engaged in farming in most countries. A greater share of young adult females than males is engaged in farming in Tanzania and Rwanda.

The off-farm sector (outside of the agrifood system) accounts for the second largest percentage of jobs for young people, employing 8.5% of the youth in Nigeria, 15.6% in Tanzania and 20.1% in Rwanda (Table 2.6). Among young adults, the off-farm sector also employs about 27.4% in Rwanda, 30.3% in Nigeria, and 29.6% in Tanzania. In all cases, young males are more likely than females to be employed in the off-farm sector outside the agrifood system, and this gender disparity appears more pronounced among young adults—males are about twice as likely as females to engage in off-farm employment outside the agrifood system. Off-farm jobs within the agrifood system (including agro-inputs, commerce and processing) provide a source of employment for less than 10% of the youth, employing about five percent in Rwanda and Nigeria, and seven percent in Tanzania. Less than 20% of young adults are employed in the off-farm stages of the agrifood system in all three countries. Between 7.6% (Rwanda) and 16.6% (Nigeria) of the young adults are engaged in this sector. A slightly greater share of females than males are engaged in the off-farm stages of the agrifood system in most countries. Almost seven percent and 22% of Nigerian women aged 15-24 years and 25-34 years, respectively, are employed in this sector, compared to 3.6 percent of male youth and 9.3% of young adult males. This trend does not appear to hold for Rwanda, where young males have a higher level of engagement than females in off-farm activities within the agrifood system. About 5.6% and 8.1% of male youth and young adults respectively are employed in the off-farm sector within the agrifood system, compared to 4.5% and 7.2% of female youth and young adults.

Table 2.6 Sectoral employment shares for 15-34 year age category from most recent nationally representative survey

		Total working age population between 15-34 years (millions)		% of working age population between 15-35 years engaged in									
				Farming		Off-farm stages of agri-food system		Off-farm outside agrifood system		Economically inactive		Unemployed	
		15-24	25-34	15-24	25-34	15-24	25-34	15-24	25-34	15-24	25-34	15-24	25-34
Nigeria (2012/13)	Total	31.2	20.6	21.4	23.5	5.1	16.6	8.5	30.3	62.7	25.7	2.3	3.8
	Males	16.6	8.1	28.1	31.0	3.6	9.3	7.7	35.9	58.3	18.6	2.3	5.3
	Females	14.6	12.4	13.7	18.4	6.9	21.6	9.5	26.5	67.7	30.7	2.2	2.8
Rwanda (2010/11)	Total	2.3	1.5	47.0	62.7	5.0	7.6	20.1	27.4	27.2	1.7	0.7	0.6
	Males	1.1	0.7	42.6	53.7	5.6	8.1	24.1	36.2	27.1	1.6	0.6	0.4
	Females	1.2	0.8	51.2	71.7	4.5	7.2	16.2	18.5	27.4	1.8	0.7	0.8
Tanzania (2011/12)	Total	9.5	5.8	51.4	46.6	7.8	15.9	18.7	31.1	19.7	4.8	2.5	1.5
	Males	4.7	2.7	52.8	42.8	6.9	14.6	21.2	39.9	16.8	2.0	2.3	0.7
	Females	4.8	3.1	50.0	49.9	8.6	17.1	16.1	23.5	22.6	7.3	2.7	2.2

Source: Authors' estimates from Nigeria General Household Survey (2012/13), Tanzania National Panel Surveys (2012); Rwanda Integrated Household Living Survey (EICV3). Rows add to 100%.
Notes: Farming comprises crop and livestock production activities including fishing and aquaculture.

Off-farm stages of the agrifood system include assembly, wholesale and retail trading of agricultural products, street food vendors, chop bars and restaurants, and food processing such as processing of fish, fruits, grain products, etc.

The largest proportion of youth (15-24 years) in most of the countries examined is economically inactive. This means that they are not working and are not looking for work, mainly because they are still in school or raising children. The percentage of individuals in the 15-24 year category that are economically inactive range from 22.5% in Tanzania to 62.7% in Nigeria. In each instance, education was cited as the main reason for economic inactivity. For instance, about 92% of the youth and 58% of the young adults in Rwanda who were economically inactive in 2011 were determined to be students. Globally, labor participation rates among the youth (15-24 years) are declining partly due to increasing enrollment in school—youth labor force participation rates declined from 59% to 47.3% between 1991 and 2014 (ILO 2015). Globalization and technology are creating an economy that demands more education to be competitive, and the youth in particular appear to be responding to this increased demand for a more educated workforce by staying in school longer, supporting Filmer and Fox's (2014) conclusion that youth entering the labor force now in Africa have more schooling than previous generations. Assuming that the education these students are receiving is valuable, the increased inactivity among the youth could mean a more educated, competitive, and productive labor force that possesses the skills necessary to transform the region's economies in the next several decades. The level of economic inactivity among young adults (25-34 years) is relatively low, ranging from about 1.7% in Rwanda to 25.7% in Nigeria. Generally, a greater share of young females than males is economically inactive. Unemployment accounts for a relatively small fraction of the working age population but generally higher among the youth and young adults than the overall population. The limited prevalence of unemployment among the working age population may partly be due to the strict ILO definitions employed in this study.

2.4.3.2 Changes in employment structure over time among youth and young adults

Tables 2.8 and 2.9 present the changes in the employment structure over time among young people within the 15-24 year and 25-34 year age categories respectively. Table 2.7 summarizes the changes in employment shares among the young people both in absolute and FTE terms. The number of young people engaged in farming is increasing in absolute terms over time in all three countries, but at different rates. In Nigeria, we observe that youth and young adults are entering farming at a faster

rate than the rate at which their population segment is growing (Table 2.8 and 2.9), and the rate of job creation in the off-farm sector. Hence, the overall share of young men and women engaged in farming is increasing over time. For instance, the share of total jobs coming from farming increased from 50.5% (41.5% in FTE) to about 61.1% (50.8% in FTE) among the youth (15-24 years) between 2010/11 and 2012/13. During the same period, young adults experienced about a five-percentage point (4% in FTE) increase in jobs coming from farming (Table 2.7). By contrast, in Rwanda, the share of farming in employment is generally declining among youth and young adults. Young men and women within the 15-24 year age category are engaging in farming at about the same rate as their population growth rate. However, since the total number of jobs in the off-farm sector is growing more rapidly than farming, the total share of farm-based employment among the youth is declining over time (Table 2.7).

Young adults (25-34 years) in Rwanda are entering farming even faster than their population growth rate, but farming's share of total jobs is declining, partly due to the more rapid growth in off-farm jobs. We also observe declining shares of farm-based employment among young people in Tanzania, where the share of youth and young adults engaged in farming decreased by three and 0.6 percentage points respectively between 2011 and 2013. The gender effect on farming employment varies across countries. In Nigeria and Tanzania, the number of young women engaged in farming is growing at a faster rate than for young men. In Rwanda, males and females are engaging in farming at almost equal rates among the young adults, but there appears to be slightly more male involvement in farming among the youth.

Table 2.7 Changes in share of jobs among young people (15-34 years)

Country	Age category	Total # of jobs in millions	Farming		Off-farm within AFS		Off-farm outside AFS	
			% of jobs	% of FTE jobs	% of jobs	% of FTE jobs	% of jobs	% of FTE jobs
Nigeria	15-24							
	2010/11	8.0	50.5	41.5	15.2	16.5	34.3	42.1
	2012/13	10.9	61.1	50.8	14.6	16.7	24.4	32.5
	25-34							
	2010/11	12.7	28.1	22.5	24.4	25.6	47.6	51.8
	2012/13	16.0	33.4	26.2	23.6	24.5	43.0	49.3
Rwanda	15-24							
	2005/06	2.0	76.0	65.3	6.0	6.3	17.9	28.4
	2010/11	2.4	65.1	50.0	7.0	8.2	27.9	41.7
	25-34							
	2005/06	1.6	70.7	59.3	8.3	10.3	21.0	30.4
	2010/11	2.9	64.1	49.0	7.8	11.4	28.0	39.6
Tanzania	15-24							
	2010/11	5.5	72.1	63.2	9.2	11.9	18.8	24.9
	2012/13	6.9	69.6	60.3	9.4	11.1	21.0	28.6
	25-34							
	2010/11	5.0	50.7	37.4	17.2	21.8	32.0	40.9
	2012/13	5.3	50.1	39.3	17.8	21.9	32.2	38.8

Source: Authors' estimates from Rwanda Integrated Household Living Survey; Tanzania National Panel Survey; Nigeria General Household Survey

Across all three countries, the number of young men and women engaged in off-farm employment, including off-farm stages of the agrifood system, is increasing, and generally at a faster rate than their population segment's growth rate (Table 2.8 and 2.9). In Rwanda, the number of jobs in the off-farm sector, both within and outside the agrifood system, is growing more rapidly than job growth in farming and the population growth rate. As a result, the percentage share of off-farm employment is increasing over time among youth and young adults. This increase is occurring more rapidly outside the agrifood system relative to the downstream stages of the food system. For instance, the share of jobs outside the agrifood system increased by 10 and 7 percentage points among the youth and young adults in Rwanda, compared to about one percentage point growth in the share of jobs in the downstream stages of the agrifood system. Similarly, in Tanzania, the growth in off-farm jobs is occurring faster outside the agrifood system among the youth, with about a 2.2% increase in the share of jobs between 2010/11 and 2012/13. However among young adults, job growth in the off-farm segment of the agrifood system was relatively faster (Table 2.7). In the case of Nigeria, the rapid growth of jobs in farming appears to eclipse any growth in jobs emanating from the off-farm sector. Hence, despite the generally positive growth rates in off-farm sector jobs within and outside the agrifood system in Nigeria, the off-farm share in total jobs is decreasing over time among both the 15-24 and 25-34 year age groups. Growth rates in off-farm employment are slightly higher among young men than women, but vary across countries. Among the 15-24 year-old youth, job growth in the off-farm sector within the agrifood system is occurring at a faster rate among males in Rwanda and Tanzania, and among females in Nigeria. This is also true among the young adults, except for Tanzania, where female young adults seem to be entering into off-farm agrifood related jobs at a faster rate than their male counterparts. In most countries, growth in off-farm based employment is occurring faster in rural areas than in urban areas among both the youth and young adults.

Lastly, several recent studies suggest that about 60% of new jobs in Africa are being created off the farm (Filmer and Fox, 2014; McMillan and Harttgen,

2014). This has sometimes been taken to mean that the majority of the jobs being taken by young people will also be off the farm. We thus explore the sources of new jobs for the three age categories—youth (15-24 years), young adults (25-34 years) and adults (35-64 years). The results presented in Figure 2.4 suggest the largest share of the total number of new jobs created between the two survey periods for each country is still coming from farming. With the exception of youth in Rwanda, the largest share of new jobs held by all the age categories in the three countries is coming from farming. This finding is robust when jobs are computed in FTE terms. Hence, it appears that farming will continue to be an important source of jobs for the youth in Tanzania and Nigeria while youth in Rwanda may be somewhat more dependent on off-farm jobs outside the agrifood system.

2.4.4 Trends in public vs. private sector wage employment vs. self-employment

What type of employment is being generated? While addressing unemployment remains critical, an overriding challenge in many developing countries is a lack of remunerative jobs that generate adequate income (Field, 2015). As countries transform their economies, the importance of self-employment, typically indicative of informality in the labor market, is hypothesized to decline over time (La Porta and Schleifer 2014; Yamada, 1996). A slowing workforce growth rate following demographic transition, and rapid growth in registered firms during the development process, combine to increase the availability of wage/salary employment and eventually make wage jobs a dominant livelihood forms (La Porta and Schleifer 2014). Here we examine the extent to which the relative share of self-employment is declining as part of the ongoing economic transformation in the region. Table 2.10 presents the share of self-employment/unpaid family labor and wage/salary employment over time. Wage employment is further disaggregated between public and private sector. Wage employment includes both formal wage (where employee has contract and may be entitled to social security) and informal wage employment.

The first observation from the Table 2.10 is the relative size of self-employment and unpaid family labor in total employment. Among the three countries, self-employment, including unpaid family labor, constitutes over 75% of total employment, perhaps indicative of the level of informality in the labor market. More strikingly, further analysis revealed that those engaged in unpaid or family labor constitute about 25%-40% of total employment for those countries with available data. Farming is the largest source of self-employment, constituting between 46% (Nigeria) and 65% (Rwanda) of all self-employment jobs, followed by the off-farm sector outside the agrifood system (30%-35%). Nearly one in nine of all unpaid jobs are also in farming. The youth (15-24 years) are more likely than any other age group to engage in unpaid jobs or family labor. From the most recent surveys, about 43% of all unpaid jobs or family labor in Rwanda, 51% in Nigeria, and 63% in Tanzania were held by the youth (15-24 years). In most African countries, the 15-24 year age range represents a period during which secondary and/or tertiary education is received. Individuals in this age range that are active in the labor force are typically out-of-school, and often lack significant employable skills, connections and experience in the labor market to secure gainful employment. Their job prospects are thus often restricted to farming and informal enterprises, which are associated with low skills requirement and relatively low returns to labor. In fact, the high proportion of young people in low quality employment, e.g., contributing to family work, is reflective of the labor market entry difficulties young people face.

Self-employment will remain an important pathway to employing a large share of the workforce, especially those youth without secondary education.

Secondly, the results suggest that self-employment will remain a key feature of the labor market in the three countries at least over the next few decades. In both Tanzania and Nigeria, the share of self-employment jobs is rising over time. Even for Rwanda, where the share of wage jobs is rising over time, this rise is starting from a very low initial base. Also, unlike the 1960s and 1980s where the public sector dominated wage employment, a greater share of wage jobs in this analysis is in the private sector. This is partly explained by the shedding of public wage jobs in 1990s, which also contributed to the low share of wage jobs observed in these economies. The off-farm sector outside the agrifood system is the main source of wage employment, accounting for over 85% and 60% of the public and private sector wage jobs, respectively. From its initial low base, wage employment is unlikely to overtake self-

employment as the dominant employment type in the foreseeable future. Self-employment therefore will remain an important pathway to employing a large share of the workforce, especially those youth without secondary school education. Recognizing the oft-neglected informal sector as a potentially viable livelihood option, and developing supportive policies to raise returns to labor in this sector, would be an important step towards improving livelihoods in the region. Moreover, the persistence of low productivity and low quality jobs among the working age population also raises questions about the appropriateness of the widely used ILO definition of unemployment as a measure of joblessness in sub-Saharan Africa. Poverty and lack of social protection for the unemployed often forces working age Africans to work in some fashion, even if under poor conditions, for low wages to support themselves. Unfortunately, by virtue of their engagement in these low quality economic activities, such individuals are often excluded from the account of joblessness as per ILO standards. As a result, they may be excluded from policy interventions aimed at combating joblessness. Expanding the definition of joblessness to cover the quality of employment and underemployment would provide a better picture of the extent of the employment challenge facing the continent.

Table 2.8 Changes in employment of youth population (15-24 years) by sector, gender, and location

		Nigeria 2011-2013		Rwanda 2006-2011		Tanzania 2011-2013	
		Male	Female	Male	Female	Male	Female
	Total # of youth (15-24 years) in base year	15,113,745	13,662,873	1,055,617	1,148,661	4,626,428	4,716,267
	% of youth (15-24 years) in urban area	39.2	43.3	18.0	18.6	28.5	33.0
	% of youth (15-24 years) in rural area	60.8	56.7	82.0	81.4	71.5	67.0
	Total # of youth (15-24 years) in end year	16,581,622	14,560,918	1,074,227	1,157,424	4,746,597	4,777,415
	% of youth (15-24 years) in urban area	37.0	39.3	15.9	17.4	27.7	32.4
	% of youth (15-24 years) in rural area	63.0	60.7	84.1	82.6	72.3	67.6
	Annual % change in # of youth from base to end year	4.9	3.3	0.4	0.2	1.3	0.6
	Urban	1.8	-1.7	-2.0	-1.2	-0.1	-0.3
	Rural	6.9	7.1	0.9	0.5	1.9	1.1
	Employment status						
Farming	# of youth (15-24 years) in end year	4,695,431	1,965,854	698,059	855,020	2,486,417	2,285,979
	Urban	376,042	190,750	42,097	52,235	260,480	187,922
	Rural	4,319,389	1,775,104	655,962	802,785	2,225,938	2,098,057
	Annual % change in # of youth from base to end year	41.5	16.1	0.4	0.2	11.7	9.4
	Urban	46.9	26.1	-1.7	-0.3	33.4	24.3
	Rural	41.1	15.2	0.5	0.2	9.8	8.4
Off-farm within agrifood system	# of youth (15-24 years) in end year	599,511	991,977	91,197	74,747	292,987	354,389
	Urban	227,570	265,963	12,770	12,446	121,461	193,358
	Rural	371,941	726,014	78,427	62,301	171,527	161,031
	Annual % change in # of youth from base to end year	12.8	17.0	11.6	3.3	17.1	12.8
	Urban	-9.2	1.9	0.0	-4.3	11.6	19.6
	Rural	43.7	25.1	14.9	5.8	21.7	6.2
Off-farm outside agrifood system	# of youth (15-24 years) in end year	1,295,846	1,362,300	394,964	270,220	802,838	635,722
	Urban	795,623	797,827	80,884	74,838	367,908	326,571
	Rural	500,223	564,473	314,081	195,381	434,930	309,151
	Annual % change in # of youth from base to end year	-0.9	-2.5	15.8	18.4	20.8	19.3
	Urban	-1.7	2.4	2.5	0.5	20.0	9.9
	Rural	0.5	-8.1	22.2	37.8	21.5	33.0
Unemployed	# of youth (15-24 years) in end year	383,446	320,096	9,936	12,211	123,433	143,963
	Urban	232,406	210,777	5,807	9,776	90,440	112,567
	Rural	151,039	109,319	4,129	2,435	32,993	31,396
	Annual % change in # of youth from base to end year	-12.6	-8.6	22.6	56.4	-10.4	-17.9
	Urban	-10.2	19.5	11.8	68.3	1.6	-4.8
	Rural	-15.8	-26.7	61.6	29.7	-25.9	-34.3
Economically inactive	# of youth (15-24 years) in end year	9,763,930	9,743,992	442,830	457,041	888,529	1,184,048
	Urban	4,393,858	4,191,618	72,198	87,377	437,307	681,184
	Rural	5,370,072	5,552,374	370,632	369,665	451,223	502,864
	Annual % change in # of youth from base to end year	4.0	5.8	4.7	5.6	-20.8	-11.4
	Urban	5.9	1.0	-0.8	-1.2	-13.9	-3.2
	Rural	2.5	10.0	6.2	8.0	-25.4	-18.9

Source: Authors' estimates from Rwanda Integrated Household Living Survey; Tanzania National Panel Survey; General Household Survey. Notes: Rural-urban classification in Rwanda is based on the corresponding geographical designations from the 2002 Rwanda Census of Population and Housing and hence may not reflect expected urban expansion.

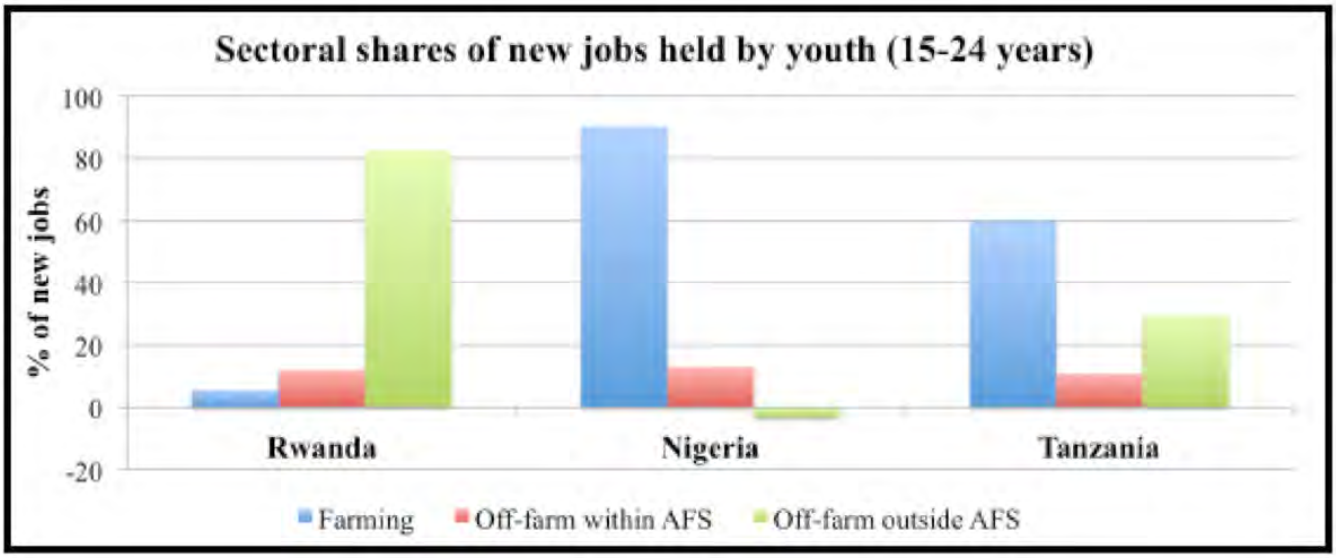
Table 2.9 Changes in employment of young adults (25-34) by sector, gender, and location

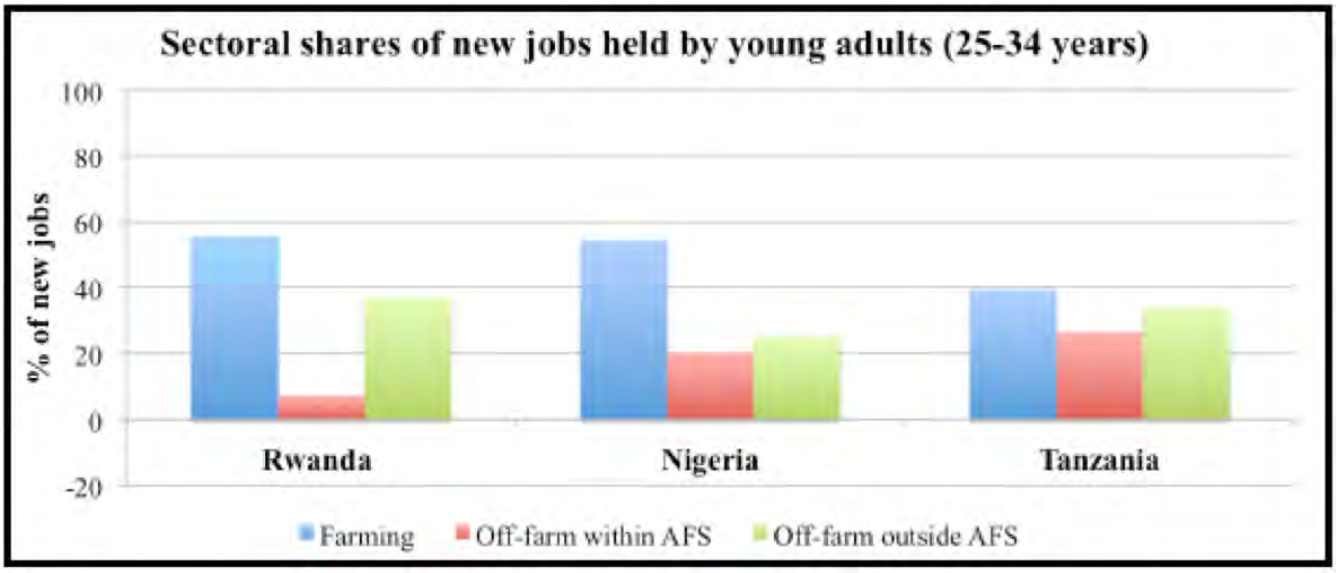
		Nigeria 2011-2013		Rwanda 2006-2011		Tanzania 2011-2013	
		Male	Female	Male	Female	Male	Female
	Total # of young adults (25-34 years) in base year	8,103,892	12,481,381	526,990	652,465	2,651,225	3,046,509
	% of young adults in urban area	45.3	41.6	21.4	20.3	34.6	35.8
	% of young adults in rural area	54.7	58.4	78.6	79.7	65.4	64.2
	Total # of young adults (25-34 years) in end year	8,110,483	12,445,777	704,534	829,130	2,730,052	3,106,494
	% of young adults in urban area	43.9	40.7	19.9	17.2	35.4	37.3
	% of young adults in rural area	56.1	59.3	80.1	82.8	64.6	62.7
	Annual % change in # of young adults from base to end year	0.04	-0.1	6.7	5.4	1.5	1.0
	Urban	-1.4	-1.2	4.9	1.6	2.8	3.2
	Rural	1.3	0.6	7.2	6.4	0.8	-0.3
Employment status							
Farming	# of young adults (25-34 years) in end year	2,866,337	2,460,120	808,539	1,068,033	1,106,075	1,534,185
	Urban	299,983	229,302	55,498	91,839	89,818	160,791
	Rural	2,566,353	2,230,818	753,041	976,194	1,016,257	1,373,395
	Annual % change in # of young adults from base to end year	21.7	28.1	12.4	12.1	2.8	2.1
	Urban	29.0	29.2	13.5	12.7	12.8	12.6
	Rural	20.9	27.9	12.3	12.0	2.1	1.1
Off-farm within agrifood system	# of young adults (25-34 years) in end year	860,738	2,898,739	122,189	106,610	388,624	547,687
	Urban	420,145	1,122,192	24,699	19,555	172,901	316,306
	Rural	440,593	1,776,547	97,489	87,054	215,723	231,381
	Annual % change in # of young adults from base to end year	-1.9	15.6	14.3	12.8	1.4	7.5
	Urban	-10.5	9.6	12.8	-2.3	-0.8	14.8
	Rural	10.6	20.1	14.8	20.7	3.3	-0.1
Off-farm outside agrifood system	# of young adults (25-34 years) in end year	3,320,355	3,547,013	544,984	275,788	1,080,144	614,783
	Urban	2,025,228	2,000,234	129,807	77,879	612,974	383,939
	Rural	1,295,127	1,546,778	415,177	197,909	467,170	230,844
	Annual % change in # of young adults from base to end year	13.5	1.4	25.9	30.6	3.0	3.8
	Urban	9.5	2.4	12.4	7.5	3.3	6.8
	Rural	20.8	0.2	32.7	55.5	2.7	-0.6
Unemployed	# of young adults (25-34 years) in end year	489,847	379,480	6,021	11,771	22,091	83,793
	Urban	345,904	306,202	4,004	9,954	17,890	69,218
	Rural	143,943	73,279	2,017	1,817	4,201	14,574
	Annual % change in # of young adults from base to end year	6.3	-8.6	11.9	48.5	-27.2	-16.5
	Urban	17.1	7.9	6.2	51.0	-16.5	-12.0
	Rural	-9.4	-31.1	36.6	37.3	-40.3	-28.6
Economically inactive	# of young adults (25-34 years) in end year	1,723,797	4,107,894	23,786	27,393	69,167	281,908
	Urban	896,357	1,565,356	6,245	13,210	39,374	213,126
	Rural	827,441	2,542,538	17,541	14,184	29,793	68,782
	Annual % change in # of young adults from base to end year	15.4	5.6	7.5	-3.0	-4.8	7.1
	Urban	18.1	9.8	-0.2	-8.0	0.1	8.6
	Rural	12.7	3.3	11.9	7.9	-10.0	3.0

Source: Authors' estimates from Rwanda Integrated Household Living Survey; Tanzania National Panel Survey; General Household Survey

**Rural-urban classification in Rwanda is based on the corresponding geographical designations from the 2002 Rwanda Census of Population and Housing and hence may not reflect expected urban expansion*

Figure 2.4 Sectoral shares of new jobs held by various age groups





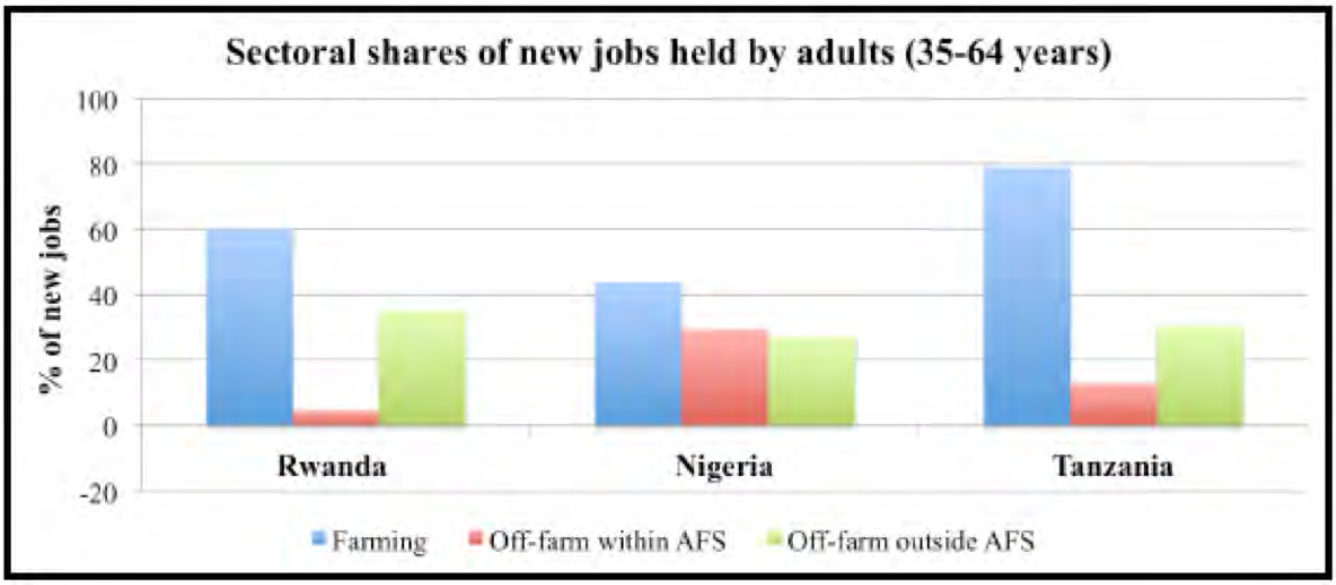


Table 2.10 Type of employment over time

Countries	% of employment		
	Wage/salary		Self-employed/ unpaid family labor
	Public	Private	
Nigeria			
2010/11	6.5	7.26	86.2
2012/13	4.41	6.99	88.6
Rwanda			
2005/06	3.2	20.4	86.6
2010/11	3.6	28.4	77.8
Tanzania			
2010/11	2.6	16.9	80.5
2012/13	3.1	15.2	81.7

2.5 SOCIO-DEMOGRAPHIC FACTORS CORRELATED WITH EMPLOYMENT STRUCTURE

We also conducted multivariate analysis to explore the effect of socio-demographic and geographic factors on the economic activity status of working age individuals, and to understand the characteristics of the individuals engaged in each employment category. For each country, we developed a multinomial logit model to estimate the likelihood that working age individuals will engage in farming, off-farm employment, or will be unemployed or economically inactive. Where possible, off-farm employment was further disaggregated between employment within and outside the agrifood system and included as one of the categories in the dependent variable. The independent variables consisted of age, education level, gender, geographic regions, survey year dummies, and interaction terms allowing us to estimate the joint effect of these factors. Age is represented by dummy variables for age categories with the youth (15-24 years) as the reference category. Three education dummies representing those with less than primary education, completed primary education, and tertiary education are included. The reference category for education is secondary education. A dummy variable for males represented gender in the model. Regions of residence are represented by dummy variables, which are included to control for differentials in employment opportunities across regions. For each country, the region of the capital city was used as the reference category. Given the categorical nature of our dependent variable and the case-specific nature of the independent variables, a multinomial logit model was employed to estimate the parameters in the model using maximum likelihood estimation. For each country, a separate model was estimated for rural and urban setting.

Tables 2.11-2.13 present the marginal effects of each variable on the probability of a working age individual falling in a particular employment category. Generally, gender, education level and age were found to be significant determinants of the working age individual's employment status in both rural and urban areas. In Tanzania and Rwanda, females were generally either equally likely or more likely to be employed in farming than males. In Nigeria, by contrast, males dominate the farming sector. In concert with the dominant narrative about the youth fleeing agriculture, we observe in most countries that the youth (15-24 years) are generally less likely to be involved in farming than the other age categories. This is particularly true for Tanzania and Rwanda in both rural and urban settings. Although a large proportion of the segment of the youth population that is active in the labor force is engaged in farming, individuals within this age category (15-24 years) are largely economically inactive. By contrast, individuals above age 24 are more likely to participate in the labor force and be employed in farming, the dominant employment sector. Hence, when considering the whole youth population, the likelihood of a youth engaging in farming relative to other age categories is lower due to the high rates of economic inactivity among the youth. In Nigeria, there are differences between the urban and rural settings in terms of the youth engagement in farming relative to other age groups. While rural youth are less likely to be engaged in farming than other groups, urban youth

do not significantly differ from other age categories in terms of their engagement in farming, except for 35-44 age category. With respect to education, farming was found to be generally associated with individuals with lower educational levels. Individuals with less than primary education were about 33% and 27% more likely than those with some secondary education to be employed in farming in rural and urban areas of Rwanda respectively. The likelihood of engaging in farming generally declines as educational attainment increases, across all the countries.

We also observe differences across countries regarding the effect of gender on employment in off-farm sector outside the agrifood system and the off-farm segment of the agrifood system. In both rural and urban areas of Nigeria, females were more likely to be employed in off-farm sectors outside the agrifood system than males. However, the converse is true for Tanzania, where men dominate off-farm employment outside the agrifood system. Also, the youth are less likely to be employed in the off-farm sector relative to all other categories, with the exception of those in the 55-64 year age group. The likelihood of employment in the off-farm sector increases from those in 24-34 year bracket, peaks among those within the 34-44 year bracket and then begins to decline starting with the 45-54 year group. Generally, the results indicate a positive relationship between education and off-farm employment. This could be explained by education's effect on job seekers' ability to process information, identify alternative work opportunities, and satisfy employers' credential and human capital requirements. The 15-24 age bracket spans the period for secondary and tertiary education. Hence, individuals in this age bracket who are active in the labor force are typically out-of-school, and relatively less experience in the labor market. Their low educational level and labor market experience limit their ability to identify off-farm self-employment opportunities and/or secure off-farm wage employment (Aryeetey et al., 2015).

In addition, the effect of education differs for employment within and outside the agrifood system. Employment in the off-farm sector outside the agrifood system appears to require a greater level of education than that within the agrifood system. Increases in educational attainment are associated with a greater likelihood of employment outside the agrifood system, but generally have no effect or decrease the likelihood of off-farm employment in the off-farm segment of the agrifood system, especially in urban settings. In fact, in all the countries examined, those with post-secondary education were generally less likely than those with only secondary education to be employed in the off-farm segment of the agrifood system. Secondary education, however, appears to be a key requirement for off-farm jobs outside the agrifood system.

Table 2.11 Multinomial logit estimates of the effect of socio-demographic and geographical factors on employment category, Tanzania

	Farming				Off-farm within agrifood system				Off-farm outside agrifood system				Unemployment				Economically inactive			
	Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban	
	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value
Male	-0.070	0.005	0.000	0.998	0.008	0.169	0.001	0.757	0.057	0.000	0.129	0.003	0.011	0.340	-0.012	0.533	-0.006	0.710	-0.118	0.001
age 25-34	0.131	0.000	0.079	0.005	0.012	0.060	0.005	0.169	-0.010	0.487	0.174	0.000	-0.002	0.660	-0.020	0.140	-0.131	0.000	-0.238	0.000
age 35-44	0.190	0.000	0.176	0.000	-0.003	0.543	0.006	0.152	-0.016	0.273	0.157	0.002	-0.012	0.010	-0.057	0.000	-0.158	0.000	-0.283	0.000
age 45-54	0.212	0.000	0.315	0.000	-0.001	0.854	0.003	0.467	-0.043	0.002	0.010	0.888	-0.014	0.009	-0.078	0.000	-0.154	0.000	-0.250	0.000
age 55-64	0.210	0.000	0.378	0.000	-0.009	0.005	-0.003	0.430	-0.077	0.000	-0.072	0.348	-0.011	0.089	-0.078	0.000	-0.113	0.000	-0.225	0.000
Less than primary education	0.155	0.000	0.137	0.000	-0.006	0.143	0.002	0.462	-0.085	0.000	-0.218	0.000	-0.005	0.379	0.009	0.553	-0.059	0.002	0.069	0.022
Primary education	0.108	0.000	0.055	0.000	-0.001	0.734	0.002	0.380	-0.056	0.000	-0.122	0.000	-0.002	0.759	0.003	0.768	-0.049	0.008	0.062	0.008
Higher education	-0.417	0.085	-0.020	0.573	-0.011	0.000	-0.017	0.000	0.412	0.061	-0.014	0.845	-0.027	0.000	-0.057	0.001	0.044	0.758	0.108	0.123
male age 25-34	-0.021	0.542	-0.024	0.248	0.001	0.882	-0.003	0.480	0.068	0.017	0.226	0.000	0.004	0.622	-0.051	0.000	-0.053	0.014	-0.148	0.000
male age 35-44	-0.099	0.027	-0.039	0.014	0.008	0.545	-0.007	0.007	0.060	0.056	0.285	0.000	-0.003	0.749	-0.036	0.059	0.034	0.388	-0.202	0.000
male age 45-54	-0.087	0.080	-0.026	0.183	-0.010	0.000	-0.005	0.230	0.063	0.106	0.248	0.000	-0.005	0.567	-0.058	0.012	0.040	0.350	-0.158	0.003
male age 55-64	-0.047	0.453	-0.020	0.375	-0.007	0.185	-0.012	0.000	0.080	0.211	0.148	0.067	-0.001	0.948	-0.019	0.654	-0.024	0.481	-0.097	0.145
Dodoma	0.267	0.000	0.746	0.000	-0.010	0.000	-0.023	0.000	-0.091	0.000	-0.482	0.000	-0.030	0.000	-0.065	0.000	-0.136	0.000	-0.177	0.000
Arusha	0.174	0.000	0.145	0.022	-0.010	0.000	-0.001	0.693	-0.055	0.000	-0.078	0.217	-0.027	0.000	-0.089	0.000	-0.083	0.001	0.023	0.676
Kilimanjaro	0.129	0.001	0.426	0.000	-0.011	0.000	-0.027	0.000	-0.057	0.000	-0.334	0.000	-0.030	0.000	-0.042	0.006	-0.031	0.373	-0.022	0.699
Tanga	0.188	0.000	0.424	0.000	-0.010	0.000	-0.010	0.000	-0.075	0.000	-0.370	0.000	-0.031	0.000	-0.058	0.001	-0.073	0.004	0.014	0.845
Morogoro	0.219	0.000	0.138	0.010	-0.011	0.000	-0.006	0.025	-0.086	0.000	-0.171	0.001	-0.029	0.000	-0.039	0.010	-0.094	0.000	0.078	0.152
Pwani	0.121	0.006	0.346	0.000	-0.011	0.000	-0.010	0.000	-0.061	0.000	-0.253	0.000	-0.024	0.000	-0.044	0.006	-0.025	0.524	-0.039	0.445
Lindi	0.149	0.000	0.193	0.002	-0.009	0.000	-0.006	0.036	-0.068	0.000	-0.189	0.001	-0.027	0.000	-0.054	0.000	-0.045	0.144	0.057	0.348
Mtwara	0.164	0.000	0.316	0.000	-0.010	0.000	-0.005	0.096	-0.070	0.000	-0.186	0.000	-0.028	0.000	-0.046	0.003	-0.056	0.045	-0.079	0.081
Ruvuma	0.187	0.000	0.490	0.000	-0.012	0.000	-0.011	0.000	-0.082	0.000	-0.319	0.000	-0.028	0.000	-0.052	0.000	-0.066	0.014	-0.109	0.016
Iringa	0.168	0.000	0.385	0.000	-0.009	0.000	-0.007	0.007	-0.075	0.000	-0.216	0.000	-0.028	0.000	-0.059	0.000	-0.056	0.060	-0.102	0.017
Mbeya	0.220	0.000	0.380	0.000	-0.010	0.000	-0.008	0.002	-0.078	0.000	-0.157	0.048	-0.029	0.000	-0.083	0.000	-0.103	0.000	-0.131	0.009
Singida	0.224	0.000	0.092	0.146	-0.011	0.000	-0.012	0.000	-0.079	0.000	0.100	0.227	-0.026	0.000	-0.020	0.535	-0.108	0.000	-0.160	0.004
Tabora	0.234	0.000	-0.001	0.987	-0.012	0.000	-0.008	0.004	-0.087	0.000	0.005	0.951	-0.027	0.000	-0.007	0.817	-0.107	0.000	0.011	0.876
Rukwa	0.229	0.000	0.427	0.000	-0.012	0.000	-0.011	0.000	-0.098	0.000	-0.335	0.000	-0.028	0.000	-0.048	0.015	-0.091	0.000	-0.033	0.582
Kigoma	0.236	0.000	0.357	0.000	-0.011	0.000	-0.003	0.487	-0.089	0.000	-0.106	0.146	-0.031	0.000	-0.076	0.000	-0.104	0.000	-0.171	0.000
Shinyanga	0.229	0.000	0.254	0.002	-0.011	0.000	-0.003	0.583	-0.082	0.000	-0.033	0.655	-0.033	0.000	-0.039	0.083	-0.103	0.000	-0.180	0.000
Kagera	0.236	0.000	0.181	0.290	-0.011	0.000	0.003	0.737	-0.083	0.000	-0.020	0.909	-0.032	0.000	-0.108	0.000	-0.109	0.000	-0.057	0.626
Mwanza	0.203	0.000	0.094	0.075	-0.011	0.000	-0.005	0.124	-0.083	0.000	0.027	0.605	-0.032	0.000	-0.047	0.001	-0.077	0.002	-0.070	0.069
Mara	0.233	0.000	0.059	0.354	-0.010	0.000	-0.008	0.064	-0.085	0.000	-0.034	0.698	-0.028	0.000	-0.064	0.000	-0.110	0.000	0.046	0.572
Manyara	0.175	0.000	0.234	0.010	-0.011	0.000	-0.019	0.000	-0.082	0.000	-0.198	0.004	-0.029	0.000	-0.051	0.015	-0.053	0.091	0.034	0.648
Zanzibar	0.089	0.036	0.080	0.023	-0.010	0.000	-0.009	0.000	-0.059	0.000	-0.284	0.000	-0.023	0.000	-0.004	0.769	0.003	0.936	0.217	0.000
Last year (2012)	-0.146	0.000	-0.010	0.472	0.010	0.010	0.000	0.846	0.048	0.000	0.010	0.736	0.076	0.000	0.034	0.006	0.012	0.344	-0.034	0.178

# of observations	8,005	4,545
R-square	0.12	0.1932
Log likelihood	-15068566	-7591329.4

-ME is marginal effect

Table 2.12 Multinomial logit estimates of the effect of socio-demographic and geographical factors on employment category, Nigeria

	Farming				Off-farm within agrifood system				Off-farm outside agrifood system				Unemployment				Economically inactive			
	Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban	
	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value
Male	0.150	0.000	0.008	0.604	-0.099	0.000	-0.030	0.233	-0.045	0.006	0.015	0.624	0.000	0.987	0.010	0.059	-0.005	0.713	-0.003	0.881
age 25-34	-0.004	0.853	-0.038	0.001	0.087	0.000	0.163	0.000	0.118	0.000	0.203	0.000	0.000	0.986	-0.006	0.136	-0.201	0.000	-0.323	0.000
age 35-44	0.055	0.114	-0.025	0.030	0.102	0.000	0.189	0.000	0.099	0.000	0.241	0.000	-0.001	0.986	-0.020	0.000	-0.255	0.000	-0.386	0.000
age 45-54	0.140	0.000	0.009	0.553	0.063	0.000	0.165	0.000	0.061	0.002	0.227	0.000	-0.001	0.986	-0.026	0.000	-0.264	0.000	-0.375	0.000
age 55-64	0.135	0.000	0.010	0.572	0.044	0.007	0.191	0.000	0.048	0.036	0.148	0.000	-0.001	0.986	-0.021	0.000	-0.226	0.000	-0.329	0.000
Less than primary education	0.025	0.464	0.051	0.007	-0.003	0.808	0.003	0.871	-0.046	0.008	-0.125	0.000	-0.001	0.986	-0.029	0.000	0.025	0.202	0.100	0.000
Primary education	0.102	0.000	0.038	0.017	-0.005	0.651	0.034	0.030	-0.043	0.003	-0.043	0.069	-0.001	0.986	-0.007	0.177	-0.053	0.003	-0.022	0.297
Tertiary education	-0.252	0.000	-0.079	0.000	-0.063	0.000	-0.063	0.000	0.298	0.000	0.070	0.008	0.001	0.986	0.037	0.000	0.016	0.640	0.035	0.150
male with less than primary	0.349	0.000	0.075	0.019	-0.063	0.000	0.056	0.115	-0.093	0.000	0.072	0.203	0.001	0.986	0.056	0.444	-0.193	0.000	-0.259	0.000
male with primary education	-0.003	0.904	0.010	0.580	-0.013	0.356	-0.017	0.437	-0.016	0.330	-0.011	0.750	0.000	0.987	-0.005	0.461	0.032	0.127	0.023	0.507
male with tertiary education	-0.028	0.584	0.136	0.026	0.035	0.311	-0.055	0.013	-0.088	0.000	-0.066	0.117	0.000	0.986	-0.007	0.131	0.081	0.062	-0.008	0.848
male aged 25-34	-0.002	0.948	0.039	0.159	0.023	0.263	-0.035	0.168	0.079	0.005	0.068	0.087	0.001	0.986	0.000	0.946	-0.101	0.000	-0.072	0.009
male aged 35-44	0.027	0.703	0.047	0.110	0.017	0.501	-0.010	0.721	0.203	0.001	0.212	0.000	0.002	0.986	-0.005	0.559	-0.248	0.000	-0.244	0.000
male aged 45-54	-0.068	0.221	-0.012	0.495	0.042	0.106	-0.015	0.615	0.255	0.000	0.270	0.000	-0.002	0.978	0.002	0.912	-0.227	0.000	-0.245	0.000
male aged 55-64	-0.095	0.093	0.007	0.773	0.039	0.189	-0.050	0.062	0.219	0.000	0.077	0.151	-0.002	0.983	-0.002	0.885	-0.161	0.000	-0.031	0.526
North east	-0.031	0.412	0.074	0.000	0.041	0.007	0.004	0.821	0.000	0.999	-0.085	0.001	0.001	0.986	0.006	0.424	-0.012	0.567	0.000	1.000
North west	-0.240	0.000	0.044	0.010	0.034	0.000	-0.029	0.062	0.022	0.048	-0.137	0.000	-0.001	0.986	-0.012	0.021	0.185	0.000	0.134	0.000
South east	-0.014	0.937	0.044	0.007	-0.002	0.960	0.007	0.657	0.027	0.705	-0.094	0.000	0.006	0.986	0.038	0.001	-0.017	0.852	0.005	0.826
South south	-0.180	0.170	0.072	0.000	0.016	0.744	-0.033	0.027	0.066	0.475	-0.150	0.000	0.007	0.986	0.028	0.006	0.091	0.507	0.083	0.001
South west	-0.070	0.096	0.000	0.996	0.036	0.082	0.037	0.011	0.009	0.678	-0.034	0.077	0.002	0.986	0.005	0.392	0.023	0.478	-0.007	0.732
Last year (2013)	0.059	0.002	0.007	0.249	0.004	0.474	0.005	0.586	-0.043	0.000	-0.016	0.208	-0.001	0.986	-0.002	0.410	-0.019	0.157	0.006	0.601
# of observations	18,137		7,996																	
R-square	0.1765		0.1966																	
Log likelihood	-19716.436		-8537.8097																	

~ME is marginal effect

Table 2.13 Multinomial logit estimates of the effect of socio-demographic and geographical factors on employment category, Rwanda

	Farming				Off-farm within agrifood system				Off-farm outside agrifood system				Unemployment				Economically inactive			
	Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural		Urban	
	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value	ME	P-value
Male	-0.034	0.016	-0.048	0.097	-0.005	0.506	0.004	0.790	0.047	0.000	0.048	0.087	0.000	0.994	0.000	0.953	-0.008	0.000	-0.004	0.659
age 25-34	0.074	0.000	0.167	0.000	0.011	0.003	0.045	0.000	-0.005	0.380	-0.073	0.000	0.000	0.994	0.000	0.948	-0.080	0.000	-0.139	0.000
age 35-44	0.081	0.221	0.231	0.000	0.005	0.451	0.045	0.001	-0.020	0.277	-0.123	0.010	-0.001	0.994	-0.005	0.944	-0.065	0.000	-0.148	0.000
age 45-54	0.082	0.021	0.301	0.000	0.001	0.900	0.040	0.031	-0.035	0.002	-0.220	0.001	0.000	0.994	-0.008	0.944	-0.047	0.000	-0.113	0.000
age 55-64	0.114	0.000	0.346	0.000	-0.015	0.004	-0.017	0.522	-0.065	0.000	-0.247	0.015	0.000	0.994	-0.018	0.924	-0.035	0.000	-0.064	0.003
Less than primary education	0.327	0.000	0.274	0.000	-0.015	0.080	-0.004	0.818	-0.155	0.000	-0.089	0.353	-0.001	0.994	-0.012	0.944	-0.156	0.000	-0.169	0.000
Primary education	0.161	0.000	0.157	0.000	-0.011	0.051	-0.001	0.968	-0.105	0.000	-0.041	0.523	0.000	0.994	-0.008	0.944	-0.046	0.000	-0.108	0.000
Tertiary education	-0.223	0.000	-0.155	0.000	-0.030	0.060	-0.060	0.000	0.210	0.000	0.233	0.000	0.000	0.995	-0.004	0.944	0.042	0.022	-0.013	0.317
male with less than primary	-0.103	0.000	-0.016	0.646	0.018	0.038	-0.014	0.366	0.071	0.000	0.047	0.229	0.000	0.994	-0.005	0.944	0.014	0.000	-0.012	0.359
male with primary education	-0.091	0.000	0.009	0.793	0.015	0.121	0.013	0.474	0.065	0.000	-0.004	0.915	0.000	0.994	0.003	0.944	0.011	0.003	-0.021	0.077
male with tertiary education	-0.038	0.603	0.120	0.066	0.080	0.265	-0.018	0.502	-0.038	0.221	-0.143	0.001	0.000	0.994	0.002	0.944	-0.004	0.707	0.038	0.158
male aged 25-34	-0.047	0.000	-0.087	0.015	0.002	0.718	0.001	0.972	0.042	0.000	0.165	0.000	0.000	0.994	-0.006	0.944	0.004	0.394	-0.073	0.000
male aged 35-44	-0.699	0.974	-0.083	0.037	-0.060	0.974	-0.025	0.140	-0.168	0.981	0.172	0.000	0.953	0.978	-0.007	0.944	-0.026	0.994	-0.057	0.003
male aged 45-54	-0.716	0.961	-0.116	0.000	-0.062	0.955	-0.051	0.000	-0.175	0.969	0.214	0.000	0.984	0.965	-0.001	0.949	-0.031	0.986	-0.047	0.006
male aged 55-64	-0.020	0.231	-0.296	0.000	-0.022	0.001	-0.099	0.000	0.032	0.043	-0.494	0.008	0.000	0.994	0.993	0.002	0.010	0.179	-0.104	0.000
Southern province	0.080	0.000	0.326	0.000	-0.020	0.002	-0.032	0.071	-0.056	0.000	-0.256	0.006	0.000	0.995	-0.011	0.944	-0.004	0.255	-0.028	0.126
Western province	0.072	0.000	0.274	0.000	-0.012	0.076	-0.015	0.281	-0.051	0.000	-0.239	0.000	0.000	0.994	-0.008	0.944	-0.008	0.028	-0.012	0.407
Northern province	0.107	0.000	0.352	0.000	-0.016	0.010	-0.054	0.001	-0.069	0.000	-0.254	0.000	0.000	0.994	-0.008	0.944	-0.022	0.000	-0.036	0.018
Eastern province	0.096	0.000	0.323	0.000	-0.016	0.014	-0.042	0.020	-0.070	0.000	-0.227	0.007	0.000	0.994	-0.011	0.944	-0.009	0.011	-0.043	0.020
Last year (2013)	-0.079	0.000	0.044	0.068	0.003	0.174	-0.016	0.019	0.084	0.000	0.022	0.502	0.000	0.994	0.004	0.944	-0.008	0.000	-0.054	0.000
# of observations	75,192		14,518																	
R-square	0.1413		0.1849																	
Log likelihood	-62940.281		-15633.663																	

-ME is marginal effect

In line with previous studies, unemployment was primarily the domain of the youth (15-24 years) (Filmer and Fox, 2014). Across all the countries explored in this analysis, the results indicate the youth are more likely to be unemployed than any of the other age categories in both urban and rural settings. Gender had no effect on unemployment. The effect of education on unemployment varied across countries. In Nigeria, higher levels of education are associated with increased chances of a working age individual being unemployed in both rural and urban areas. This finding is consistent with growing evidence for increasing levels of unemployment among higher education graduates in Africa (Aryeetey et al., 2015; Filmer and Fox 2014). Some scholars attribute this to the slow expansion of jobs in public sector, on account of policies to reduce government wage bills, which reduces job openings that is traditionally filled by this group (Aryeetey et al., 2015). Another reported contributor is the skills mismatch between what employers are seeking and what jobseekers receive from African educational institutions (Flimer and Fox 2014). The positive relationship between education and unemployment, however, appears not to hold for Tanzania, where the likelihood of unemployment decreases with education in urban setting. Also, in Rwanda, education had no significant effect on the likelihood of an individual becoming unemployed.

Gender, age and educational level of working age individuals were also found to influence participation in the labor force. In all three countries, females were more likely than males to be economically inactive, probably a reflection of women's traditional role as caregivers. Economic inactivity was also associated more with the youth (15-24 years) than any of the other age categories in both rural and urban settings in concert with global trends (ILO 2014). Generally, education is not linearly related to economic inactivity. Individuals with secondary education are more likely to be economically inactive relative to those with primary education or less, or those with post-secondary education. The age group of the youth spans the period during which secondary and tertiary education is received. Hence, the bulk of the youth making up economically inactive individuals are in school. As revealed in this study, education and training appears to be the main reason for economic inactivity in the three countries.

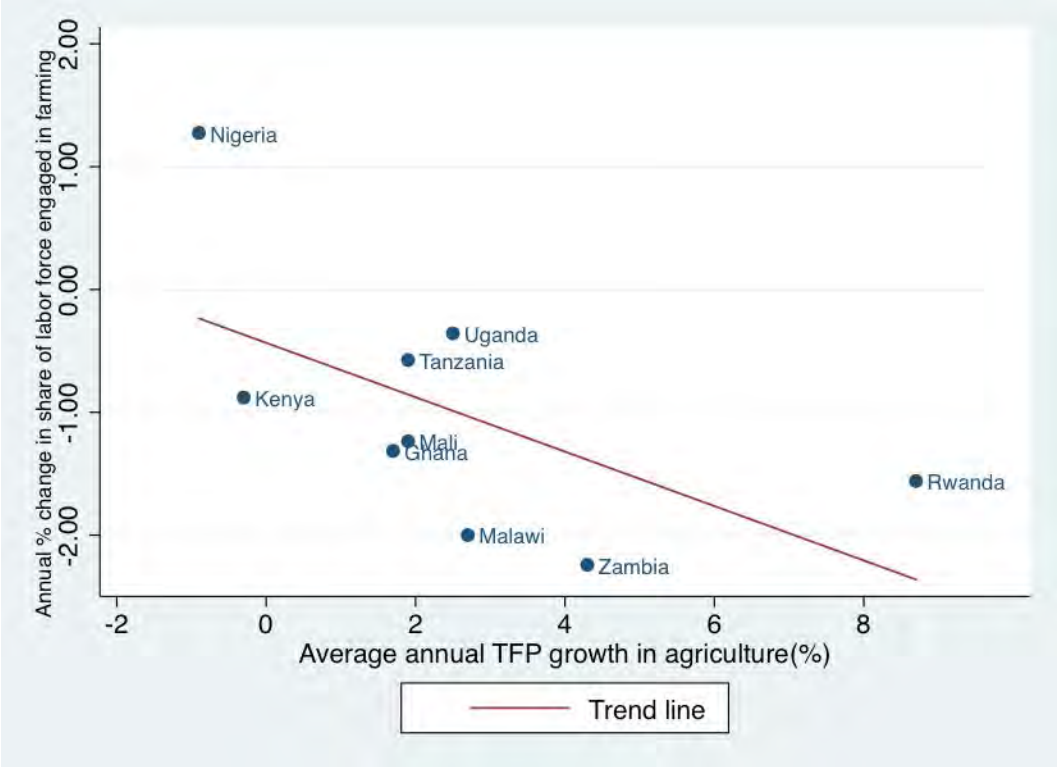
2.6 THE RELATIONSHIP BETWEEN FARM PRODUCTIVITY GROWTH AND EMPLOYMENT OPPORTUNITIES FOR YOUTH

Africa is now on the move. Despite cross-country variability, our analysis of employment trends to date has documented that, since 2000, the share of the labor force primarily engaged in small-scale farming has been declining rapidly in most countries. Today, farming accounts for 55 to 70% of primary employment in Africa's working-age population, down from 70 to 80% just 10 years ago. The share of the work force engaged in farming has declined most rapidly among countries enjoying the highest rates of agricultural productivity growth (Figure 2.5). This pattern is consistent with historical structural transformation processes in Asia and elsewhere, where agricultural productivity growth was the primary driver of economic transformation and associated shifts in employment opportunities and the labor force to off-farm sectors among countries in their early stages of development where a large share of the work force was still engaged in farming.

Farmland ownership patterns in Sub-Saharan Africa are also changing rapidly. While farms under five hectares still account for 90% of all farms in the region, an increasing portion of agricultural land is controlled by medium-scale and large-scale farms owned by African investor farmers. While most survey datasets are unable to provide accurate estimates, our work to date indicates that medium-scale farms between 5 and 100 hectares control between 30 and 50% of total farmland in Ghana, Kenya, Zambia, and Malawi (Jayne et al., 2015; see also Lowder, 2016). Farmland ownership patterns are also shifting between rural and urban areas. Evidence now indicates that urban people control between 15 and 35% of national agricultural land and an even greater portion of farm holdings over 20 hectares. Moreover, the share of urban households' control of national agricultural land is rising rapidly in some countries (Jayne et al., 2015).

Driving these changes, in part, are population pressures and increased world food prices, which in turn increase demand for land (Otsuka & Place, 2014; Landesa, 2012). Land prices appear to have risen dramatically in areas of high agro-ecological potential within reasonable proximity of urban areas (Jayne et al., 2015; Ricker-Gilbert et al., 2016). These trends have created new stresses on the ability of customary tenure systems to protect small-scale

Figure 2.5 Relationship between total factor productivity growth and change in share of working age engaged in farming



Source: Yeboah & Jayne (2016). Mean annual agricultural TFP growth rates for 2003-2012 from USDA TFP dataset (Fuglie, 2015); Spearman Correlation coefficient = -0.6862, prob > |t| =0.0412

farmers' land from encroachment or appropriation. The region has experienced rising demand for agricultural land by both international and national companies (Jayne et al., 2014a; Deininger & Byerlee, 2011), as well as urban investor farmers (Jayne et al., 2015; Sitko et al., 2014). Increased interest in African farmland may also be explained by the perception that there are large areas of unclaimed "available" arable land in Africa for investment; however, recent approximations estimate a much smaller amount of available land (Sitko & Chamberlin, 2015; Chamberlin, Jayne, & Headey, 2014).

Governments have also become increasingly aware of the potential for revenue generation from the lease or sale of agricultural land, and many are reportedly putting pressure on customary land administration institutions to gain leverage over "unutilized" rural land. This trend is particularly problematic given that land rights under most customary systems are, almost by definition, undocumented. This suggests that even if customary rights holders or their leaders do have the authority to (re-) allocate rights, in particular to non-community members, these decisions may be based on less than complete information on the actual amount and location of truly unclaimed land. Moreover, Deininger and Byerlee (2011) and Diao et al. (2013) report widespread allegations that local chiefs sometimes perceive themselves to be "essentially private owners of the land" instead of trustees on behalf of their communities, and inefficient land administration systems have led to the sale or lease of customary land without the participation or even knowledge, in many cases, of communities and individuals who have customarily used the land.

As land becomes scarcer and its value rises, land rental markets are growing in importance (Holden et al., 2009). The research evidence generally finds that land markets are positive developments—they shift land from less productive to more productive users and support overall agricultural productivity growth (Jin & Jayne, 2013; Chamberlin & Ricker-Gilbert, forthcoming). However, because of risks associated with renting out land (especially when land tenure is insecure), there is mounting evidence that the demand for rented land greatly exceeds the willingness of individuals to rent out their land, resulting in an unmet demand for rented land (Chamberlin & Ricker-Gilbert, forthcoming) and a consequent rise in land rental rates in many parts

of the region. While evidence is patchy, in some places, the returns to renting in land are generally advantageous for renters, but not always for those renting out land (Ibid). If land tenure policies do not adequately protect current users or actively restrict land rentals, as in Ethiopia, it is likely that the rate of growth of land rental and sales markets will be low and hence the rate of growth of agricultural production and productivity and the type of farmer and employment effects from land use will also be retarded.

These trends raise questions about how land policies influence both the process of economic transformation and the degree to which such transformations are accompanied by rapid poverty reduction and equitable growth. The remainder of Chapter 2 reviews evidence to date about the relationships between land policy, agricultural transformation, and broader economy-wide transformation, with particular emphasis on the influence of policies related to land allocation, land tenure formalization, and land administration on these economic transformation processes.

2.6.1 Multiplier effects from agricultural productivity growth

Most development economists accept the notion that for countries in their early stages of development, agricultural productivity growth is the main engine of structural transformation. The pioneering work of Johnston and Mellor (1961), Johnston and Kilby (1975), and Mellor (1976) first documented the structural transformation process in the regions of Asia that experienced Green Revolutions. In much of Asia, green revolution technologies and supportive government policies kick-started rural economic growth processes, primarily in irrigated lowland areas. As millions of rural farmers had more cash to spend, this stimulated the demand for off-farm goods and services, created new jobs in the off-farm economy and pulled millions of people off the farm into more productive jobs. Over time, the gradual shift of the work force from farming to off-farm sectors has transformed the economic and demographic structure of much of Asia. Agricultural productivity growth in these areas of Asia is widely regarded as a major catalyst (if not *the* major catalyst) to this structural transformation process.

Over the past 15 years in Africa, there is strong evidence that agricultural productivity growth has also been a major determinant of the pace of transition out of farming as well as labor productivity in the broader economy. Figure 2.5 shows that the countries achieving the highest rate of agricultural total factor productivity tend to have the most rapid shift in the labor force out of farming. Figure 2.6 shows that the countries achieving the highest rates of agricultural productivity growth (over two distinct periods since 2000) also have the greatest increases in labor productivity in the *off-farm segments of the economy.* These patterns, also seen in Asia's structural transformation process, lend support to the notion that the expansion of job opportunities for youth will be greatly affected by government policies and programs affecting the rate and inclusivity of productivity growth in farming.

Asia's experience supports the economic theory that secure formal land tenure for those currently working the land can contribute to economic growth via three main channels. First, by incentivizing landholders to invest and improve agricultural productivity, since there is assurance that returns from their investments will not be appropriated. Second, by allowing factor mobility and efficiency gains, as land can be transferred to the most productive, efficient farmers via land markets. And third, by easing access to formal credit so farmers can more readily invest in their land or acquire new land (Deininger, 2003; Brasselle et al., 2002; Besley, 1995).

The literature abounds with estimates of the multiplier effects of agricultural growth in early-stage developing countries (see Haggblade et al., 2007 for a useful review). The majority of applied studies of early-stage developing countries conclude that the multiplier effects resulting from agricultural productivity growth are considerably higher than multiplier effects resulting from off-farm growth. This view is consistent with relationships shown in Figure 2.5 indicating that the rate of structural change in the labor force from farm to off-farm employment is related to the pace of agricultural productivity growth.

2.6.2 Land distribution patterns and the multiplier effect

Surprisingly little research has addressed why agricultural growth multipliers are larger in some cases than in others. A specific line of enquiry is whether land distribution patterns might influence the relationship between agricultural productivity growth and broader economic transformation. As a thought experiment, consider whether a given rate

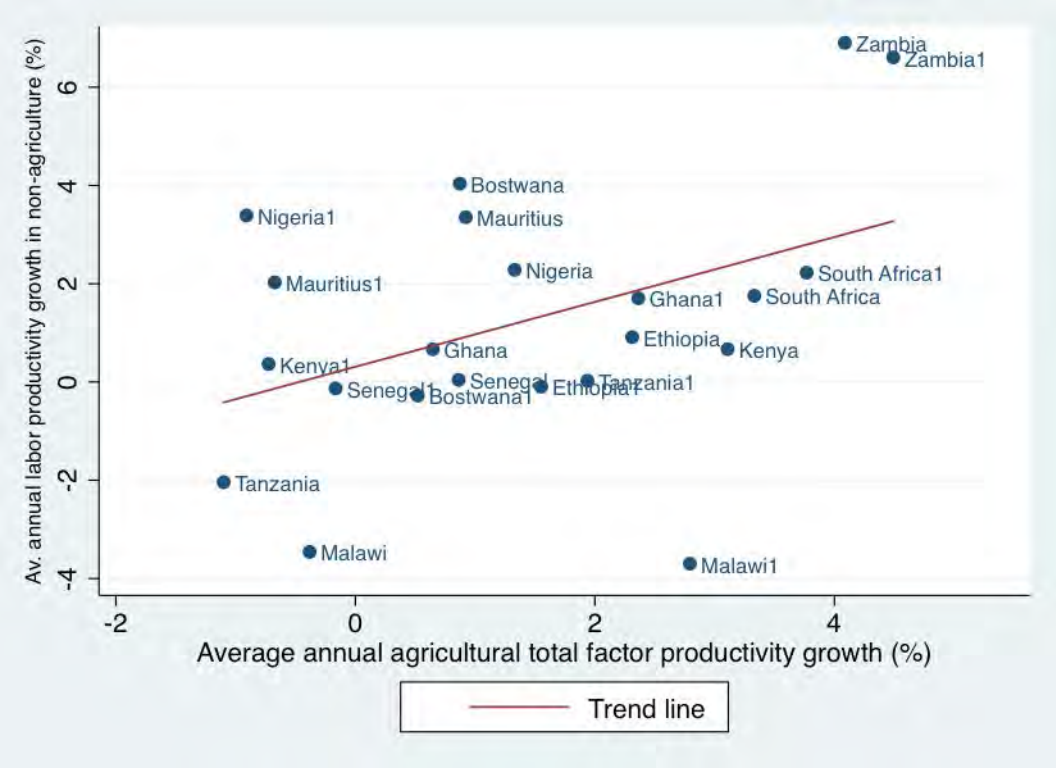
of annual agricultural productivity growth in a 1,000 hectare country would produce stronger growth multipliers if there were 1,000 one-hectare farms, or 100 ten-hectare farms, or 10 one hundred-hectare farms, or one 1,000 hectare farm? The distribution of income and expenditures within the population of this heuristic country could be very different.

Johnston and Kilby (1975), Mellor (1976), and more recently Deininger and Squire (1998) and Vollrath (2007) have demonstrated that relatively egalitarian land distribution patterns have tended to generate more broadly based growth and consequently higher rates of economic growth than in cases where land distribution was highly concentrated. The basic reason for this is that broad-based agricultural growth tends to engage more people earning and spending money in the cash economy, which generates greater second-round expenditures in support of local non-tradable goods and services in rural areas and towns. These multiplier effects tend to be much weaker when the source of agricultural growth is concentrated in relatively few hands. Regions of Latin America dominated by large *latifundia* farms and South Africa are often invoked as examples where agricultural growth may have contributed relatively little to broadly-based economic growth (Binswanger et al., 1995).[10]

Moreover, evidence indicates that not only does the initial distribution of assets affect the rate of economic growth, but it also affects the poverty-reducing effects of the growth that does occur. For example, Ravallion and Datt (2002) found that the initial percentage of landless households significantly affected the elasticity of poverty to off-

10 Land and credit policies biased toward large-scale agriculture have been found to dispossess small-scale farmers of their land, encourage mechanized rather than labor-intensive production, and largely fail to reduce rural poverty even during periods of rapid agricultural growth (Lopéz & Valdés 2000; World Bank 2009). Latin America has the most concentrated farm structure of all regions of the world. Landholding size Gini coefficients reported by Vollrath (2007) range from 0.81 for Latin America to 0.59 for South Asia to 0.49 for sub-Saharan Africa.

Figure 2.6 Relationship between agricultural total factor productivity and average labor productivity in non-agricultural sectors



Source: Yeboah and Jayne (2016). Agricultural total factor productivity growth rates derived from USDA TFP dataset (Fuglie, 2015) and computed as mean annual rates over 2001-2005 and 2006-2011 periods; labor productivity growth rates (mean annual rates over 2001-2005 and 2006-2011 period) derived from Groningen Global Development Centre employment. NB: two points are shown for each country; the latter period (2006-2011) for each country is denoted with "1" (e.g. Malawi1 represents Malawi 2006-2011).
Spearman Correlation coefficient = 0.3721, rob > |t| = 0.0881

farm output in India. In a sample of 69 countries, Gugerty and Timmer (1999) found that, in countries with an initial "good" distribution of assets, both agricultural and non-agricultural growth greatly benefitted the poorest households with positive poverty reducing effects. In countries with a "bad" distribution of assets, however, economic growth was skewed toward wealthier households, causing the gap between rich and poor to widen. It is especially noteworthy that in this latter group of countries, agricultural growth was associated with greater increases in inequality than was non-agricultural growth.

All this would lead one to believe that highly concentrated patterns of land ownership in Africa would contribute to lower growth multipliers from agricultural productivity, but that is not exactly what we are finding. A nearly completed set of studies of Kenya, Tanzania, and Zambia undertaken by a consortium of Michigan State University, CIMMYT, University of Pretoria, and ReNAPRI are finding that the relationship between labor productivity and land distribution patterns is complex (Jayne et al., forthcoming; Hichaambwa et al., forthcoming; Chamberlin and Jayne, forthcoming; Muyanga et al., forthcoming). It is usually the case that the local Gini coefficients of land ownership are indeed inversely related to mean household labor productivity in farming after controlling for other household and community level covariates. However, and perhaps surprisingly, the Gini coefficient of land ownership at the district level is not highly correlated with other dimensions of land distribution patterns, such as the percentage of landless people in the district or the percentage of cultivated area on farms over 5 hectares of land. The lack of strong correlation between these measures indicates that "land concentration" is a multi-dimensional concept and that care must be taken to understand how land policies may affect these indicators of land distribution in different ways.

We find that in most cases the strongest multiplier effects of localized agricultural productivity growth on off-farm and total labor productivity in a given area are generated from farms over 5 hectares of operated farm size, which account for a relatively small proportion of the region's farms but a more sizeable portion of its area under cultivation. It is on these farms that the greatest marketable surpluses are generated and therefore where cash injections into the local economy are greatest. By contrast, small farms generate little surplus production and very little injection of cash into the local economy. In other words, agricultural commercialization and injections of cash into the local economy are needed before growth multiplier effects can be generated from farming. These findings are similar to those of Mellor (2014), who finds that small-scale commercial farmers in the 5-20 hectare range of operating farm size are generating the strongest growth multiplier effects from agriculture in Ethiopia. They account for a relatively small portion of total farms but a relatively large portion of area under cultivation. All of this points to the hypothesis that in contemporary sub-Saharan Africa, a farm structure capable of generating significant farm commercialization (both from the sales of agricultural products and the purchasing of inputs and agribusiness services) may generate the greatest employment and income multipliers within the local economy.

Africa's agricultural experience to date may be somewhat different than Asia's Green Revolution. In Asia, agricultural transformation was led by small-scale farmers, whose tenure was in many cases secured through large-scale land rights formalization interventions that encouraged their investment into the land. For instance, in the 1980s and 90s, Vietnam de-collectivized land, allocated plots to households in a relatively equitable way, and then introduced official land titles and newly permitted land transactions (Ravallion & van de Walle, 2006). Increased farmer investment into the land led to higher productivity and better rural livelihoods just as urban growth drove demand for agricultural commodities and provided off-farm employment, thus leading to a large multiplier effect and robust economic growth.

African land titling programs that were designed to enhance tenure security in the hopes of stimulating agricultural productivity and broad-based economic growth à la the Asian experience have had mixed results. The majority of farms in Sub-Saharan Africa access land via customary or traditional tenure systems that allow them to cultivate individual plots and/or use communal land for grazing, firewood harvesting, and other rural livelihood strategies. In many cases, the land they use is legally held by the state (a common land ownership structure throughout the continent); thus, small-scale farmers often do not have legal ownership of the land. Nonetheless, in many places, customary tenure systems have historically provided farmers with sufficient tenure security to make long-term investments on their plots, and emerging evidence

suggests these systems continue to provide high levels of tenure security (Stickler and Huntington 2015).

2.6.4 Youth access to land

Access to land by rural youth is becoming an increasingly important factor influencing labor productivity in farming and hence youth's decisions to stay where they are in farming or migrate in search of better opportunities. The search for employment and land are the two most important reasons cited by rural Zambian youth having migrated to other rural areas of the country between 2000 and 2012 according to a nationally representative rural survey (Chamberlin et al., forthcoming). Rural outmigration from densely populated and land-constrained areas of Kenya has been four times higher than in relatively sparsely populated rural areas (Jayne and Muyanga, 2012). Holden and Bezu (2014a) find that rural youth whose parents have relatively little land or farm assets are more likely to migrate out of the area than other youth.

The apparent paradox of rising land scarcity amidst overall land abundance in Africa is largely reconciled after considering that 91% of Africa's remaining arable land is concentrated in nine countries (including the Democratic Republic of the Congo, Angola, and Sudan), many of which are politically fragile states. The recent rise in land investment by both local and foreign investors reflects rising land value and land scarcity in Africa's other 45 countries. Roughly a third of the region's surplus land is currently under forest cover. The conversion of forests to cropland would entail major global environmental costs, but it is likely to happen under the land institutions currently prevailing in much of the region. The concentration of surplus land resources in just a few countries—many of them afflicted by long-running civil conflicts—means that even improving roads and reducing yield gaps will not be sufficient to improve access to land for youth in high-density rural areas. After excluding the few African countries where most of the unutilized arable land is located, the remaining 40 or so countries are either already land constrained, or close to approaching the full extent of their arable land area (Chamberlin et al., 2014). The list of countries with little surplus land remaining includes some of Africa's most populous countries (Nigeria, Ethiopia, Uganda) as well as countries where land pressures have contributed to fomenting civil conflicts (Kenya, Rwanda, Burundi). In east and southern Africa, the amount of arable land has risen only marginally over the 1980-2010 period, but the percentage of households engaged in agriculture has grown threefold. Headey and Jayne (2014) used FAOSTAT data to separate African countries for which we have farm size data into land constrained and land abundant groups. In most of the land-constrained countries most smallholder farms are gradually shrinking. Headey and Jayne (2014) estimate that average farm sizes in this group of countries have shrunk by 30% to 40% since the 1970s.

A final and emerging cause of increased land scarcity in Africa concerns the region's unique demographic trends. There are two relevant features of this trend. First, Africa is the only region in the world that will experience continued rural population growth until 2050. Rural Africa's population is estimated to be 53% larger in 2050 than it was in 2015. Africa will have more rural people than China and Southeast Asia combined by 2050. In contrast, China is already experiencing declining rural populations, and most of Asia will do so by 2030.

Second, Africa is only beginning its demographic transition, and the share of young people in the total population will be unusually high for the next several decades. In 2015, 63% of its rural population will be under 25 years of age. Roughly 122 million young people will enter the labor force between 2015 and 2025, with slightly more than half of them from rural areas, putting immense pressure on both agriculture and off-farm sectors to generate employment opportunities. However, even under highly favorable conditions, Filmer and Fox (2014) estimate that over this same period less than 25% of the youth will be able to find wage jobs. This means that farming and the informal sector (including the downstream stages of the food system) will be called upon to provide gainful employment for at least half of Africa's young labor force in most countries. However, for agriculture to effectively fulfill this mandate, young people growing up in densely populated areas will require access to technologies that are radically more productive and profitable, as well as access to new land.[11]

A related consequence of Africa's demographic "youth bulge" is that intergenerational subdivision of land will constrain the options of rural youth entering the labor force. Intergenerational and inter-

11 The fact that yield gaps remain on the order of 80% in Africa for current technologies (Deininger and Bylerlee 2011) suggests that the existence of improved technologies is not sufficient to guarantee their implementation.

sibling conflicts may intensify further because rural parents in their 50s and 60s may not yet be ready or able to "retire" and bequeath their land assets to their children, or otherwise subdivide their land. Inheritance of land, long considered a birthright of people growing up in rural areas, will be increasingly difficult. In Kenya, roughly a quarter of young men and women born in rural areas start their families without inheriting any land from their parents, forcing them to either commit themselves to off-farm employment (including migration), to renting land, or to buying land from an increasingly active land sales market (Yamano *et al.* 2009). Land-related intergenerational conflicts are also likely to rise when younger family members have to rely on land as source of livelihood as a result of limited non-agricultural income generating opportunities. Youth returning home from cities reproach elderly members for selling or renting out too much land to migrants (Ngaido, 1993; Le Meur, 2006). Evidence from Northern Tanzania shows that as land increases in value due to emerging commercial interests, fathers are less willing to provide land to their children, which further increases the prevalence of intergenerational conflict (Le Meur and Odgaard, 2006). Land-related conflicts may be part of broader processes undergirding recent evidence of a strong correlation between countries prone to civil conflicts and those with burgeoning youth populations (e.g.,Fuller, 1995; Beehner, 2007).

In summary, Sub-Saharan Africa is clearly very heterogeneous and many countries do not yet suffer from land scarcity (to the extent we can detect it through labor-land ratios). However, most of the region's rural young people already live in relatively highly densely populated areas where the potential for crop area expansion is very limited. The demographic forecasts for the region suggest that the scarcity of land resources will intensify over the next several decades.

Countries such as Japan and South Korea, which now rely on manufacturing and technology-driven service economies, were predominantly smallholder farming societies 60 years ago. Through good policies and public investments in infrastructure, agricultural research breakthroughs, and extension services to help farmers benefit from new technologies, smallholder farmers in these countries increased their productivity and incomes, thereby supporting the demand for off-farm businesses and the growth of employment opportunities off the farm. Over time, most young people who would have otherwise remained small-scale farmers eventually moved into these off-farm jobs.

Africa's transformation from a semi-subsistence, small-scale agrarian economy to a more diversified and productive economy will require unwavering support for smallholder farmers so that they are able to participate in and contribute to the region's economic transition rather than be marginalized by it. While migration from farm to off-farm sectors and from rural to urban areas will provide the brightest prospects for the transformation and modernization of Africa's economies, it will happen only as fast as educational advances and growth in the off-farm job opportunities will allow. These advances in turn depend on income growth among the millions of families still engaged in smallholder agriculture. Hence, even as Africa slowly urbanizes, smallholder agriculture will remain fundamental to absorbing much of Africa's burgeoning young labor force into gainful employment.

Africa's transformation from a semi-subsistence, small-scale agrarian economy to a more diversified and productive economy will require unwavering support for smallholder farmers so that they are able to participate in and contribute to the region's economic transition rather than be marginalized by it.

Government policies and public investment can make agriculture much more attractive to young people—by making it profitable. Public investments in agricultural R&D, extension programs and rural infrastructure will surely help. So will government policies to promote incentives and scope for investment by the private sector. Markets for smallholder farmers are also central determinants in the success and timing of how developing country economies move out of poverty. They relate specifically to youth employment objectives in two ways. First, agricultural input, output, land, labor and financial market opportunities influence production choices (e.g. adoption of improved seeds and farm management practices); without improvements in output markets, our attempts to increase the productivity of smallholder farmers will progress relatively slowly. Second, the link between productivity and poverty reduction is governed

by how well agricultural input, output, labor, land and financial markets function (Christiaensen et al., 2012; Timmer, 2014). And public efforts to protect the land rights of rural communities can be achieved while also encouraging the development of investor farms and large commercial operations in appropriate locations. Judicious land policies can promote synergies and minimize sacrifices. In these ways, governments hold the key to determining whether the region's economic transformation will be a relatively smooth, robust and peaceful process or a painful and protracted one.

2.7 CONCLUSIONS AND IMPLICATIONS

This chapter has examined the demographic and employment shifts within the working age population in three African countries. Despite variations across countries, some broad observations are apparent from the results. First, there has been rapid transformation in the African economies since 2000, with a highly variable pattern of labor reallocation from farming to off-farm sectors across countries. Generally, the number of working age (and young people) engaged in farming is increasing in all three countries, but the share of farming in total employment is declining over time in most countries except in Nigeria. Despite its declining employment share, farming remains the largest single source of employment for young people and the entire working age population. With the exception of Rwanda, where the off-farm sector outside the agrifood system is the largest source of new jobs for the youth (15-24 years), most of the new jobs held by the youth and working age individuals in all three countries and age categories are in farming.

Second, the pace of economic transformation from farm to off-farm over the past decade is related to the rate of agricultural productivity growth. The share of the work force engaged in farming has declined most rapidly among countries like Rwanda, enjoying the highest rates of agricultural productivity growth over the period. In addition, countries achieving the highest rates of agricultural productivity growth (over two distinct periods since 2000) also have the greatest increases in labor productivity in the non-farm segments of the economy. These patterns are consistent with economic transformation processes in parts of Asia, where sustained agricultural growth generated strong multiplier effects through which millions of small farmers spent and recycled money in the rural off-farm economy, igniting demand and employment growth in off-farm sectors and encouraging a gradual shift in the labor force from farm to off-farm activities. The observed pattern lends support to the notion that the expansion of job opportunities will be greatly affected by government policies and programs affecting the rate and inclusivity of productivity growth in farming. However, because the observed rapid labor exit from farming among Africa's work force occurred during an era of strong agricultural productivity growth influenced by high world food prices, it is not clear whether the pace of the workforce's transformation out of farming will continue at the same pace over the next decade.

Third, the share of jobs in the off-farm segment of the agrifood system, while growing rapidly in percentage terms, is starting from a low base and currently accounts for less than 10% of the youth and 23% of the working-age population in the three countries. Hence, even with rapid percentage growth, the off-farm segment of the agrifood system will not generate as many new jobs as the off-farm sector outside the agrifood system and farming.

Virtually no country in the world has ever successfully transformed its economy from an agrarian to a modern economy with low poverty rates without sustained agricultural productivity growth.

Fourth, observed employment trends are generally robust whether *employment* is defined in terms of counts of jobs or in terms of *full-time equivalents*. The latter measure computes the share of individual's work time over the year that can be allocated to a range of jobs allowing us to estimate how dependent people are on particular jobs for their livelihood. Due to the seasonal nature of farming, the share of employment from farming was consistently lower when computed using the FTE approach, while that for the off-farm sectors rises. Nonetheless, the pattern of employment and employment changes computed based on counts is generally similar to that computed based on FTEs. In fact, the two approaches both showed that farming is the largest employment category in the three countries, and that the pace of exit from farming has been most rapid in Rwanda, followed by Tanzania and then Nigeria.

Fifth, shifts in employment trends being observed for the youth are remarkably similar to that of the total working-age population, regardless of whether we define youth as between 15-24 or 15-34 years of age. This is not so surprising, considering that the 15-24 age range contains roughly 40% of the total working age population, whereas the 15-34 age range contains over 55%. The main difference observed among the 15-24 age group is the extent to which they are economically inactive. Roughly 40% of young women and 30% of young men in this age group are economically inactive due primarily to their pursuit of advanced education and training, and secondarily because of child rearing, in the case of women. Also, slightly over half of the economically inactive populations in Nigeria and Rwanda have received at least secondary education. It appears that Africa's young workforce in 2025 will be substantially better educated than it was in 2000 and well placed to face labor market challenges if the education and training they are receiving equips them with the entrepreneurial, behavioral and socio-emotional skills required for productive employment in the future.

The encouraging finding of increasing educational attainment in Africa's workforce is tempered, though, by the fact that even in 2025 over 50% of the rural work force in any of the three countries will not have more than a primary school education. With such low educational and skill levels among such a large portion of the labor force, a rapid transition of the workforce into well-paying off-farm jobs is infeasible in most areas. This, coupled with the large share of the population currently engaged in farming, suggests the sector will continue to be a dominant source of employment for most working age individuals (including young people) in at least in the next few decades, even if its share is declining. It is thus essential that farming remains viable and productive to enhance employment opportunities for the expanding labor force (Losch, 2012). A viable and productive agricultural sector could also be the source of the effective demand required to stimulate growth and employment creation in the off-farm sector (Mellor 1976, Lipton, 2006). As suggested by the ample literature on growth linkages (Mellor 1976), farm productivity growth has the highest impact on off-farm income and employment. Virtually no country in the world has ever successfully transformed its economy from an agrarian to a modern economy with low poverty rates without sustained agricultural productivity growth. This chapter has also demonstrated how rapid declines in the share of farm-based employment is linked with positive growth in agricultural total factor productivity. Yet, in general, productivity levels in agriculture in sub-Saharan Africa remain low, lagging behind all other sectors despite being the dominant employment sector. Hence, a major source of employment growth in the region will be the rate and inclusiveness of farm productivity growth. Investment directed at increasing productivity in farming has considerable potential to affect the greatest numbers of the people and generate broad-based and inclusive agricultural growth with greater multiplier effects on off-farm job creation in all the three countries. Therefore, an important potential role for The MasterCard Foundation and organizations concerned with creating employment opportunities is to advocate for policies and programs that promote farm productivity growth.

Advocating for judicious land tenure and land allocation policies will be crucial in order for farming to be attractive and profitable for the youth.

Lastly, a key constraint to promoting broad based agricultural productivity growth through farming is access to land, especially in land-scarce regions like Rwanda. Population pressures, increases in world food prices, and associated rising interest in Africa's arable land drive up land prices in the region, limiting the ability of the youth in particular, to access land. Advocating for judicious land tenure and land allocation policies will therefore be crucial in such areas in order for farming to be attractive and profitable for the youth, and more importantly for farming to generate strong growth multipliers that rapidly expand the number of jobs being created in the off-farm segments of the economy that will ultimately pull rural youth out of farming and into more attractive off-farm jobs.

CHAPTER 3:

DOWNSTREAM REPORT

D. Tschirley, M. Kondo, J. Snyder

3.1 INTRODUCTION

This chapter focuses on how changes in consumer demand that are unfolding across many African countries drive the structure of employment in those countries. In doing so, it complements Chapter 2, which documented the demographic and employment shifts underway and focused especially on the relationship between farm productivity growth and employment opportunities for youth.

Four fundamental facts inform the analysis in this chapter. We list these here, then explain them in the succeeding paragraphs. First, local demand dominates import and export demand. Second, exports can be key contributors to growth in particular circumstances. Third, the impacts of rising incomes on consumer expenditure are well known in the medium- to long-term; in the short-term, however (our fourth point) these effects can vary across countries depending on particular circumstances.

The first point is that the vast majority of the value of food consumption in most countries of Sub-Saharan Africa comes from the local economy–from food production on the farm, from value-added to this local production, and from value added to imported commodities through processing, packaging, distribution, wholesaling, and retailing. In the three countries that are the focus of this chapter—Nigeria, Tanzania, and Rwanda—between 85% and 95% of the total value of consumer expenditure on food comes from value created in these ways within the local economies. This fundamental fact means that the pattern of employment within these countries' agrifood systems is driven primarily by local demand.

Secondly, exports can be an important engine of growth for particular commodities and for relatively better-off farmers and agribusinesses. Most exports from Africa also present the enormous advantage of having nearly no limit to absorptive capacity—most African countries are "price takers" in world markets, meaning they can sell all they produce without affecting the price they receive. An efficient and entrepreneurial company operating in a conducive economic environment can thus see its sales grow dramatically, and an entire export sector (such as horticulture in Kenya) can see the same kind of unbridled growth under the right circumstances. Yet exports in our three countries range only from 3% of local consumer expenditure on food in Nigeria up to 11% in Rwanda, with Tanzania at 7%. Overall, local demand will thus be a much greater driver of overall patterns of employment growth, while exports will be key contributors in particular circumstances.

The third point is that the essential relationships between consumers' income and their demand for food are well known, and the broad pattern of effects that rising incomes will have on employment can therefore be fully anticipated over the medium- to long-run. These relationships have been captured in two economic laws: Engel's Law and Bennett's Law. Engel's Law explains the evolution of demand for food relative to non-food as income grows. It states that, as income rises, the proportion of income spent on food falls, even as actual expenditures on food rise. In other words, expenditure on food rises, but expenditure on non-food goods and services rises faster. In the poorest countries, demand for food may rise nearly as fast as non-food in the early phase of growth, but non-food growth quickly begins to outstrip that of food.

The employment corollary of this pattern is that work moves increasingly off the farm into rural non-farm employment (RNFE) and urban employment as income grows, satisfying increasingly prosperous consumers' demand for non-food goods and services.

Bennett's Law explains change in the types of food demanded by consumers as their incomes rise. It states that, as incomes grow, consumers spend more of their food budget on perishable items such as fresh produce, dairy, and meats, and less on staple cereals and root crops. As with Engel's Law, absolute expenditure on all items tends to rise for a prolonged period even as the relative expenditure shifts in the direction of perishable foods.

Related to Bennett's Law and recently being documented in Africa (Reardon et al., 2015; Tschirley et al., 2015a, 2015b), is a strong trend towards the consumption of processed foods as incomes grow. With demand growing for perishable and processed foods, it is the unprocessed non-perishable foods such as pulses, whole grains, and roots and tubers that tend to "lose out" in a relative sense as consumer demand grows.

Perishable and processed foods require much more value added after the farm than do unprocessed and non-perishable foods. This value added comes from perishable foods' need for cold chains and from the costs involved in processing and packaging. Because value added generates (requires) employment, the employment corollaries of Engel's and Bennett's Laws together are that work moves progressively off the farm into the off-farm portions of the agrifood system and, even more rapidly, to the economy outside the agrifood system.

The fourth fundamental fact that informs this chapter is that, within these broad and very robustly observed patterns, individual countries can differ substantially in how and how fast this transformation takes place. As a result, the structure and trends of demand, and of employment, can differ in their details across countries.

We examine these differences in this chapter. Specifically, this chapter does four things. First, it characterizes the broad relationships between incomes, consumer expenditure, and employment in seven countries of Sub-Saharan Africa (SSA): Nigeria, Rwanda, Tanzania, Uganda, Mozambique, Malawi, and Zambia. It maintains a particular emphasis on Nigeria, Rwanda and Tanzania, but places these in a broader regional context.

Second, the paper projects the growth in demand, over the next five years, of a detailed matrix of food items classified according to their level of processing and the commodities they contain (see the next section for more detail on the classification scheme). The focus on processing content, and not just commodity, adds a dimension not typically seen in such analyses and links it directly to agribusiness opportunities.

Third, the paper uses very recent and still emerging evidence on the response of local agribusiness to growing demand for processed foods, and considers whether these firms might be able to remain competitive in the rapidly changing marketplace, or if instead, imports are likely to capture much of the projected growth in demand.

Finally, the paper quantitatively models the evolution of employment in the three countries over the next five years, as driven by the evolution of consumer demand. We limit ourselves to five years as it is a typical time horizon over which investment and programmatic decisions are made, due to rising uncertainty as the time horizon is lengthened.

3.2 DATA AND METHODS

This paper relies primarily on data from household-level Living Standards Measurement Study (LSMS) surveys in seven countries. These surveys capture, among other things, household expenditure on detailed lists of food- and non-food items, and employment over the past year of all household members. These data are used to examine current patterns of consumer expenditure and employment, to project the evolution of consumer expenditure over a five-year period and to tie these consumer expenditure projections to projections of the evolution of employment over the same period. LSMS data is from Nigeria, Tanzania, Rwanda, Uganda, Malawi, Mozambique, and Zambia,[1] all available from the World Bank LSMS data page[2].

LSMS data are complemented by data from Comtrade at the 6-digit International Standard Industrial Classification (ISIC) level for imports and exports[3]. Finally, we use data from the United

1 The specific surveys are Malawi's Third Integrated Household Survey (IHS) 2010/11; Mozambique's Inquérito Sobre Orçamento Familiar (IOF) of 2008/09; Tanzania's National Panel Survey, 2011/11; Uganda's National Panel Survey of 2011/12; Zambia's Living Conditions Monitoring Survey VI (LCMS VI) of 2010; Rwanda's Integrated Household Living Condition Survey (EICV3) of 2010/11; and Nigeria's General Household Panel Survey of 2012/12.

2 http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/0,,contentMDK:23617057~ pagePK:64168445~piPK:64168309~theSitePK:3358997,00.html

3 ISIC is the International Standard Industrial Classification of All Economic Activities. See http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

Nations for current and projected population, and from the International Monetary Fund Regional Economic Outlook (October 2015) for projected GDP growth rates. Both these latter sets of data are used for the employment projections presented in the latter portions of this chapter.

We apply a common categorization scheme to all LSMS expenditure data and the Comtrade data. All food expenditure items as listed in each country's surveys are placed in a matrix defined by (1) the commodities in the food item, and (2) the level of processing, perishability, and source of the item (purchased or own consumption, and whether purchased in prepared form). The matrix is shown in Table 3.1.

Purchased foods are unprocessed if they undergo no transformation from their original state beyond removal from the plant and (for non-perishables) drying. "High processed" foods satisfy at least two of the following three conditions: multiple ingredients; physical change induced by heating, freezing, extrusion, or chemical processes (i.e. more than simple physical transformation); and packaging more complex than simple paper or plastic. Foods satisfying one of these criteria are classified as "low processed". The categorization of each of the more than 2,200 food expenditure items across the seven data sets are available upon request.

Table 3.1 Categorization scheme for all expenditure, import and export data

Source/Processing/Perishability			Wheat & Rice	All other cereals	Pulses	Roots & Tubers	Oilseeds	Fruit	Veg	Poultry & Eggs	Other Meat	Dairy	Fish	Other Food
Own Production		Perishable				x	x	x	x	x	x	x	x	x
		Non-Perishable	x	x	x	x	x			x		x		x
Purchased	Unprocessed	Perishable		x	x	x		x	x	x	x		x	x
		Non-Perishable	x	x	x		x			x				x
	Low Processed	Perishable	x		x	x		x	x	x	x	x	x	x
		Non-perishable	x	x	x	x	x			x				x
	High Processed	Perishable	x	x	x	x	x	x	x	x	x	x	x	x
		Non-perishable	x	x	x		x	x	x	x	x	x	x	x
	Food away from home		x	x	x	x	x	x	x	x	x	x	x	x

Note: Classification into source/processing/perishability category is made on the basis of the food expenditure item. Thus, for example, a portion of wheat expenditure is classified in high processed perishable because it is used in bread, which has a limited shelf-life. Similarly, pulses and other grains can enter into perishable consumer items such as baby food. "other food" includes sugar, herbs and spices, other ingredients, and all other food items not capture in the other categories.

Table 3.2 Agrifood system (AFS) allocation ratios of jobs partially within the agrifood system, by county

	Share of food expenditure in all market expenditure (i)		Share of non-food agriculture in all agriculture (ii)	AFS allocation ratio	
	Urban	Rural		Urban	Rural
Malawi	0.475	0.594	0.124	0.540	0.644
Mozambique	0.292	0.300	0.109	0.369	0.376
Nigeria	0.521	0.603	0.009	0.525	0.607
Rwanda	0.366	0.412	0.026	0.382	0.427
Tanzania	0.496	0.551	0.062	0.527	0.579
Uganda	0.352	0.422	0.053	0.386	0.453
Zambia	0.414	0.516	0.095	0.470	0.562

*Source: Share of food expenditure in all market expenditure computed by authors from LSMS data; share of non-food agriculture in all agriculture from FAO STAT; AFS alocation ration = i+(1-i)*ii.*

Once the food item is categorized by processing/perishability/source (the rows in Table 3.1), its quantity is allocated across commodities (the columns of Table 3.1) based on the commodities it contains. For example, all maize meal (a low processed non-perishable item that contains only maize) is allocated to the commodity group "all other cereals"; it thus lies in the cell defined by "other cereals" and "low processed non-perishable". As another example, pasteurized milk is fully allocated to dairy; because it is classified as high processed perishable, it lies in the cell defined by "dairy" and "high processed perishable".

Foods with more than one ingredient are allocated across multiple commodity groups based on the estimated quantity share of each ingredient; these shares were established based on internet searches of typical recipes for these goods. For example, "spaghetti", a high processed non-perishable food, is allocated 71% to "wheat and rice" and 29% to "poultry and eggs", based on its relative content of wheat flour and eggs. Fruit juice, a highly processed perishable item, is allocated 50% to fruit and 10% to other foods (primarily for sugar). The total allocation for all fruit juices is thus only 60%, because we want to count only agricultural products, and fruit juices typically contain water in addition to the fruit and sugar. Maheu, a traditional drink in Southern Africa which is classified as low processed perishable, is allocated 6% to "other cereals" (for the maize or sorghum that serve as the base for the drink), 2% to pulses (for the soy meal that is mixed with the other grain), and 3% to other foods (for sugar). The rest of the weight of Maheu is water and so is not allocated.

We generate five-year projections on consumption and employment, using methods adapted from Tschirley et al., 2015. Demand projections are based on (a) mid-point arc elasticities of expenditure estimated for each of the cells with data in Table 3.1 and (b) real annual GDP growth rates for each country taken from the International Monetary Fund (IMF) regional outlook forecast for 2016 (IMF, 2015). We assume that the projected 2016 rates will continue on average for the succeeding four years. We evaluate each food category's potential contribution to job growth by examining its projected total percentage growth over the five year period and its contribution to growth in total demand over all foods. We are thus able to identify four categories of food types based on their growth profile:

- "Best bets": Food groups with a substantial starting level of demand and which are expected to show fast growth, resulting in a large contribution to total demand growth;
- "The steady set": Food groups with a large starting demand footprint but which are expected to show more moderate growth, resulting in a still meaningful contribution to total demand growth;
- "Promising but small": Groups expected to show fast growth but from a small starting base of demand, resulting in a moderate contribution to total demand growth but large opportunities for some firms; and
- "Least promising": Groups exhibiting slow growth and a small contribution to total demand growth. This low contribution could come either from extremely slow growth from a large base, or from moderate growth from a low base.

These projections of growth in demand are tied to growth in employment through a categorization scheme for jobs that allows direct linking of it with the categorization of consumer expenditure explained above. The jobs categorizations that link to the expenditure scheme are based on ISIC system, as follows:

- Farming: all labor on one's own farm or as an employed farm laborer (ISIC code 01 and all its 4- and 6-digit sub-codes);
- Food manufacturing: all transformation of food and agricultural products for later consumption (ISIC codes 10-15 and their 4- and 6-digit sub-codes);
- Food marketing and transport: Four- or six-digit codes within ISIC codes 49-52 that relate to food and agricultural products;
- Food preparation away from home: Food services (ISIC code 56 and its sub-codes); and
- Non-agrifood system: all jobs other than those in farming, food manufacturing, food marketing and transport, and food preparation away from home.

This paper uses the "structural scenario" approach of Tschirley et al. (2015b), adapted from Timmer (2012). This scenario is based on the long-term relationship between per capita incomes and farming's share in a country's workforce, and rests on the fundamental dynamic of the "structural transformation" of economies, in which households move from low-productivity sectors of the economy (almost always farming in low income countries) to higher productivity sectors, thus improving their own circumstances and at the same time driving broad productivity growth in the economy (Timmer, 1988; see also McMillan and Haartgen, 2014 for recent evidence from Africa).

We estimated this relationship individually for Tanzania and Nigeria using time series data for each country from the Groningen Growth and Development Centre (GGDC) 10-Sector Database (Version 2014)[4]. This database, maintained by University of Groningen, provides a long-run internationally comparable dataset on sectoral employment and other variables in Africa, Asia, and Latin America. Because Rwanda is not included in the database, we set its estimated coefficient equal to the coefficient in a regression on all non-resource rich SSA countries.[5]

In some cases it was not possible to fully allocate a given job to the agrifood system or outside the agrifood system. For example, "wholesale trade" could relate fully to food trade, fully to non-food trade, or to a combination of the two. In such cases, jobs were allocated partially to the agrifood system and partially to the non- agrifood system, through a computation based on the economy's share of food in total expenditure and the share of non-food agriculture in all agriculture; agrifood system allocation shares and explanation of the calculation are in Table 3.2.

4 The regression was simple ordinary least squares (OLS) of farming's share in total employment, regressed against log per capita real purchasing power parity income. See Tschirley et al. (2015b) for estimated coefficients.

5 The estimated coefficients were -0.257 for Tanzania and -0.508 in Rwanda. These reflect the historical pattern of robust exit out of agriculture with growing incomes, more rapidly in Rwanda than in Tanzania. Both coefficients were significant at 99%. In Nigeria, the regression returned an insignificant coefficient, suggesting no reliable relationship between growth in the country's income and the share of its workforce in farming. This is a common feature of resource-rich African countries, discussed in Tschirley et al. (2015b) and others. We therefore set Nigeria's coefficient equal to zero, amounting to an assumption that labor would *not* leave agriculture in Nigeria over the next five years. The patterns for each country implied by these coefficients are broadly consistent with what was found in Chapter 4 of this report regarding the recent historical pattern of exit from farming: most rapid in Rwanda, slowest (or even negative) in Nigeria, with Tanzania between these two.

3.3 BROAD PATTERNS OF PER CAPITA INCOME, CONSUMPTION, AND WORK

We start our empirical analysis by examining the broad relationships between per capita income, consumption, and work in the seven countries. As discussed in the Introduction to this chapter, these patterns are broadly governed by Engel's Law, but can be expected to vary across countries. Table 3.3 orders the countries by per capita total expenditure, as computed from the LSMS surveys.

We expect the share of farming in all work, and the share of own production in all consumption, to fall with per capita income; people move off the farm and rely more on markets for their food as incomes rise. This pattern is broadly maintained among the seven countries. The share of farming in all work follows expectations quite closely, with a nearly monotonic decline with per capita expenditure. Mozambique, with the lowest per capita expenditure, has the highest share of own farming in all work and the highest share of own production in all consumption —both as expected given its low total expenditure. Nigeria, with the highest total expenditure, has the lowest shares in each. Among the other countries between these two extremes, the relationship between income and the share of own production in all consumption is less clear, but this is mediated by issues of import reliance, urban share in population, productivity, and other factors, and does not detract from the broad pattern.

Among the three focus countries, Rwanda has the highest share of food consumption from own production (39%), meaning its consumers rely the least on food purchased in the market. Nigeria shows the lowest reliance on own production at 16%, and Tanzania lies between the two, at 30%. Overall, reliance on the market for food is very high in these countries, and is not driven just by urbanization: in each country, even *rural* households obtain more than half their food from markets (74% in Nigeria, 55% in Rwanda, and 56% in Tanzania).

Table 3.4 focuses on the relationship between incomes, the type of food consumption, and the share of all work inside the agrifood system but off the farm; these relationships are governed by Bennett's Law as discussed above. We focus on the share of processed vs. unprocessed foods, the share

of food away from home (FAFH)[6], and the reliance on markets for food. Once again, patterns are very much as expected though with some variation in the middle range of countries. Nigeria has the highest share of processed food consumption and the highest reliance on markets, while Mozambique is lowest in each case. FAFH shows an even stronger association with incomes, its share rising in lockstep with country income until Nigeria, where its share falls to 15%—still high and above every other country except Tanzania's 20%.

6 Food away from home (FAFH) refers to prepared food and beverages purchased for consumption outside the home, In the context of this study, this includes "street food" prepared by informal vendors on roadways or inside traditional markets; traditional alcoholic beverages consumed in the informal locales where they are made, and food purchased from a wide range of formal outlets including fast food restaurants, full-service restaurants, buffets, hotels, and others.

Among our three focus countries, Rwanda has the lowest share of processed food in its diet, and this is reflected in its very low share of all work that takes place in the off-farm portion of the agrifood system (only 8%). Nigeria is the most reliant on purchases (83%), has the highest share of processed food in its diet (58%), and correspondingly has the highest employment in the off-farm portion of the agrifood system (24%). Tanzania is more similar to Nigeria than to Rwanda in this sense: it has the third-highest processed food share and the second-highest share of work that takes place off the farm but inside the agrifood system.

Table 3.3 Broad patterns of per capita income, consumption, and work

	Per capita total expenditure (real PPP, 2011)	Share of ...	
		Farming in all work	Own production in all food consumption
Mozambique	638	0.78	0.57
Malawi	681	0.54	0.34
Rwanda	**722**	**0.53**	**0.39**
Zambia	920	0.47	0.23
Uganda	1023	0.50	0.36
Tanzania	**1170**	**0.43**	**0.30**
Nigeria	**1817**	**0.35**	**0.16**

Notes: Farming includes own farming and farm labor. All employment calculations on FTE basis.
Source: Authors' calculations from LSMS data.

Table 3.4 The role of markets in food access, level of post-farm value added in food consumption, and work in the off-farm portion of the agrifood system

	Per capita total expenditure	Shares of all food that is purchased				Share of all work inside the AFS but off the farm
		Unprocessed	Processed	Food away from home (FAFH)	Total purchased	
Mozambique	638	16%	27%	1%	43%	14%
Malawi	681	21%	45%	2%	66%	8%
Rwanda	**722**	**25%**	**37%**	**4%**	**61%**	**8%**
Zambia	920	23%	54%	6%	77%	11%
Uganda	1023	17%	48%	10%	65%	14%
Tanzania	**1170**	**17%**	**53%**	**20%**	**70%**	**22%**
Nigeria	**1817**	**25%**	**58%**	**15%**	**83%**	**24%**

Source: Authors' calculations from LSMS data.

In summary, Rwanda's off-farm agrifood system is quite underdeveloped, with low reliance on markets, low consumption of processed foods and FAFH, and correspondingly low employment in the off-farm portion of the agrifood system. The story is quite different in Nigeria and Tanzania: in both, reliance on markets is higher, consumption of processed foods and foods outside the home is much higher, and as a result, much higher shares of work—nearly one-quarter in each country—takes place in the off-farm portion of the agrifood system.[7]

3.4 ANTICIPATING THE EVOLUTION OF FOOD DEMAND OVER THE NEXT FIVE YEARS

We develop a simple projection model to examine what types of foods are likely to see the most rapid growth in demand over the next five years in Nigeria, Rwanda, and Tanzania. We examine two measures of growth: the absolute rate of growth of each type of food in our matrix of commodity x processing/perishability/source, and their growth relative to each other. These measures are driven by three parameters:

- Anticipated economic growth in each country. This sets the overall level of demand growth around which demand for each food item will vary. Projected growth rates are set equal to the IMF's forecast, in October 2015, of growth rates in real total GDP for each country during 2016 (IMF, 2015); we assume that these rates will continue over the entire five-year period.
- The estimated demand elasticities for each cell in the matrix. The higher the demand elasticity, the higher will be the growth in demand for that item. Elasticities above 1.0 imply that, in percentage terms, demand for the item will growth faster than overall demand. Overall demand for food is nearly always less than one (Engel's Law), but demand for specific items can exceed this value, especially in low income countries.
- The starting food budget share of each food type or cell in the matrix, i.e., the percent of all food expenditure that is dedicated to each type of food. For a given elasticity of demand, a food item with a higher starting budget share will show higher *absolute* growth, and will thus account for a larger share of the total growth in demand for food.

Estimated demand elasticities are shown in Tables 3.5-3.7. Starting budget shares are in Tables 3.8-3.10.

Figures 3.1-3.4 provide a first summary of results, separately by each of our two classification schemes. Figures 3.1 and 3.2 focus on the processing/perishability/source categorization. They show, respectively, the percent growth of each food type within this categorization (driven by overall demand growth and the demand elasticities), and the contribution of each food type to overall growth in demand (determined by each type's percent growth and its starting budget share).

Five results stand out. First, growth in Nigeria is lower across the board, as driven by the lower IMF forecast for GDP growth. Second, in all three countries, demand for unprocessed non-perishable foods—primarily grains and pulses—grows the slowest. Third, FAFH shows the most rapid growth in Nigeria and Tanzania; in Rwanda, its growth is very high, but it lies in only third place after highly processed perishable and non-perishable items, and tied with low processed perishable foods.

Fourth, unprocessed perishable foods—fruits and vegetables but also fresh roots and tubers in Nigeria and Rwanda—are also major contributors to total growth. This category ranks second in total growth contribution in Nigeria and Tanzania, and first in Rwanda.

Finally, the high rates of growth in FAFH in Nigeria and Tanzania, together with their high starting budget shares (15% and 20%, respectively), result in outsize contributions to total growth in food demand: nearly 25% of all growth in food demand comes from this source in Nigeria, and nearly 35% in Tanzania. These are major growth areas in these economies' agrifood systems.

7 Mozambique is an outlier, with very high shares of work on the farm and in the non-farm agrifood system, reflecting very low productivity in both those sectors relative to its neighbors.

Table 3.5 Estimated midpoint arc elasticities, Nigeria

Commodity Class	Processing/perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice	1.163	0.211				0.818	1.253	1.129	1.265	0.929
All other cereals	0.039	-0.500		0.423		0.497	1.462	1.387	1.268	0.196
Pulses	1.694	-0.195		0.883		1.236	1.457		1.260	0.794
Roots & tubers	0.559	0.615	1.081			1.099			1.266	0.945
Oilseeds	1.651	1.015		0.175			0.923	0.667	1.260	0.802
Fruit	0.778		1.329		1.319		1.027		1.252	1.228
Vegetables	0.542		0.826		0.282		1.164		1.154	0.868
Poultry & eggs	1.179		1.455		1.609		1.525		1.254	1.452
Other meat	1.480				1.058		1.568		1.261	1.114
Dairy	-0.435	1.514					1.250	1.315	1.261	1.167
Fish	1.068		1.025		0.924		1.039		1.229	0.986
Other food	1.589	1.115				0.892	1.514	1.415	1.281	1.198
	0.733	-0.172	1.027	0.713	1.062	0.849	1.247	0.944	1.256	0.851

Source: Authors' estimations from LSMS data for each country

Table 3.6 Estimated midpoint arc elasticities, Rwanda

Commodity Class	Processing/perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice		0.753		1.225		1.245	1.473	1.424	1.398	1.289
All other cereals	0.786	0.644	0.621	0.785		0.782	0.719	1.525	1.370	0.836
Pulses	0.603	0.446	1.564	0.266		1.003			1.370	0.458
Roots & tubers	0.161	0.255	0.542		0.111	0.504			1.370	0.347
Oilseeds	0.802	0.171	-1.588	0.412		-0.013	1.588	1.077	1.360	1.014
Fruit	0.704		1.202				1.112	0.338	1.388	0.942
Vegetables	0.306		1.180					1.588	1.388	0.900
Poultry & eggs	1.312	1.366	1.556	1.506		1.588	1.213	1.585	1.395	1.426
Other meat	0.677	-1.588			1.392		1.588	1.298	1.375	1.372
Dairy	1.102						1.413	1.222	1.405	1.314
Fish	0.178		0.923		1.413			1.540	1.370	0.968
Other food	-0.124	0.576		0.880		1.168	1.496	1.537	1.073	1.212
	0.435	0.461	0.918	0.343	1.268	0.991	1.199	1.284	1.173	0.897

Source: Authors' estimations from LSMS data for each country

Table 3.7 Estimated midpoint arc elasticities, Tanzania

Commodity Class	Processing/perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice	1.176	0.492		1.334		1.133	1.334	1.479	1.356	1.125
All other cereals	0.318	-0.211	0.790	-0.043		0.558	-0.221	1.500	1.262	0.392
Pulses	0.954	0.083	1.206	0.759					1.366	0.690
Roots & tubers	0.146	-0.557	1.014			-0.557			1.364	0.409
Oilseeds	-0.092	-0.181					1.401	0.850	1.351	0.902
Fruit	0.874	1.220	1.114					1.196	1.436	1.114
Vegetables	-0.321		0.887				-0.651		1.365	0.713
Poultry & eggs	0.788		1.421		1.286		1.222	1.504	1.351	1.063
Other meat	1.048				1.167				1.364	1.175
Dairy	0.596						1.118		1.383	0.937
Fish	0.757		0.894		1.530		0.700		1.379	0.910
Other food	0.596	0.707		0.504		0.844	1.222	1.317	1.385	1.204
	0.558	-0.077	0.987	0.643	1.184	0.818	1.010	1.106	1.361	0.843

Source: Authors' estimations from LSMS data for each country

Table 3.8 Starting budget shares, Nigeria

Commodity Class	Processing/Perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	Total
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice	0.01%	0.83%	0.00%	0.00%	0.00%	10.07%	2.81%	0.04%	1.67%	15.43%
All other cereals	0.00%	4.94%	0.00%	2.93%	0.00%	0.46%	0.01%	0.67%	1.21%	10.22%
Pulses	0.00%	1.14%	0.00%	5.05%	0.00%	0.06%	0.07%	0.00%	0.73%	7.06%
Roots & tubers	5.09%	0.52%	8.10%	0.00%	0.00%	1.26%	0.00%	0.00%	1.71%	16.68%
Oilseeds	0.09%	0.55%	0.00%	0.00%	0.00%	0.00%	0.08%	5.35%	0.99%	7.06%
Fruit	0.31%	0.00%	1.07%	0.00%	0.54%	0.00%	0.18%	0.00%	0.22%	2.32%
Vegetables	0.72%	0.00%	5.57%	0.00%	0.18%	0.00%	0.46%	0.00%	1.37%	8.31%
Poultry & eggs	0.71%	0.00%	0.66%	0.00%	1.27%	0.00%	0.05%	0.00%	0.30%	2.99%
Other meat	0.62%	0.00%	0.00%	0.00%	7.62%	0.00%	0.06%	0.00%	0.98%	9.27%
Dairy	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	0.00%	0.77%	2.76%
Fish	0.67%	0.00%	1.78%	0.00%	5.95%	0.00%	0.03%	0.00%	0.89%	9.30%
Other food	0.00%	0.03%	0.00%	0.00%	0.00%	2.74%	0.14%	1.92%	3.75%	8.58%
TOTAL	8.42%	8.02%	17.18%	7.99%	15.55%	14.59%	5.68%	7.98%	14.59%	100%

Source: Authors' estimations from LSMS data for each country

Table 3.9 Starting budget shares, Rwanda

Commodity Class	Processing/Perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	Total
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice	0.00%	0.39%	0.00%	0.03%	0.00%	3.56%	1.36%	0.14%	0.06%	5.53%
All other cereals	2.25%	1.22%	0.25%	0.34%	0.33%	2.90%	1.45%	1.68%	0.13%	10.56%
Pulses	0.48%	8.88%	0.11%	5.32%	0.00%	1.25%	0.00%	0.00%	0.21%	16.25%
Roots & tubers	11.98%	1.85%	7.72%	0.00%	0.47%	1.98%	0.00%	0.00%	0.31%	24.31%
Oilseeds	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.05%	4.27%	0.07%	4.43%
Fruit	5.56%	0.85%	3.58%	0.00%	0.00%	0.00%	0.46%	1.21%	0.13%	11.78%
Vegetables	3.08%	0.00%	5.08%	0.00%	0.00%	0.00%	0.00%	0.01%	0.13%	8.31%
Poultry & eggs	0.09%	0.12%	0.23%	0.10%	0.00%	0.02%	0.29%	0.15%	0.01%	0.99%
Other meat	0.11%	0.00%	0.00%	0.00%	3.21%	0.00%	0.01%	0.01%	0.04%	3.39%
Dairy	1.25%	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.04%	3.86%
Fish	0.04%	0.00%	1.61%	0.00%	0.10%	0.00%	0.00%	0.05%	0.03%	1.83%
Other food	0.00%	0.30%	0.00%	0.18%	0.00%	3.79%	0.12%	1.75%	2.61%	8.75%
TOTAL	24.85%	13.66%	18.58%	5.96%	4.12%	13.49%	6.31%	9.27%	3.76%	100%

Source: Authors' estimations from LSMS data for each country

Table 3.10 Starting budget shares, Tanzania

Commodity Class	Processing/Perishability/source class									
	Own Production		Unprocessed		Low Processed		High Processed		Food away from home	Total
	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable	Perishable	Non-Perishable		
Wheat and rice	0.06%	1.76%	0.00%	0.21%	0.00%	5.83%	1.61%	0.12%	1.62%	11.21%
All other cereals	0.91%	8.99%	0.15%	0.80%	0.00%	4.98%	0.00%	0.91%	3.61%	20.35%
Pulses	0.16%	3.00%	0.89%	2.90%	0.00%	0.00%	0.00%	0.00%	1.07%	8.03%
Roots & tubers	3.49%	0.00%	1.71%	0.00%	0.49%	0.00%	0.00%	0.00%	0.84%	6.54%
Oilseeds	0.07%	0.06%	0.00%	0.00%	0.00%	0.00%	0.08%	3.10%	0.50%	3.80%
Fruit	3.49%	0.02%	2.55%	0.00%	0.00%	0.00%	0.04%	0.07%	2.04%	8.20%
Vegetables	1.53%	0.00%	4.77%	0.00%	0.00%	0.00%	0.12%	0.00%	0.99%	7.41%
Poultry & eggs	2.60%	0.00%	0.28%	0.00%	0.98%	0.00%	0.24%	0.12%	0.57%	4.80%
Other meat	1.12%	0.00%	0.00%	0.00%	5.92%	0.00%	0.00%	0.00%	1.00%	8.04%
Dairy	1.85%	0.00%	0.00%	0.00%	0.00%	0.00%	1.62%	0.00%	0.43%	3.90%
Fish	0.31%	0.00%	2.49%	0.00%	0.00%	0.00%	1.34%	0.00%	0.74%	4.89%
Other food	0.01%	0.28%	0.00%	0.16%	0.00%	3.76%	0.32%	1.69%	6.62%	12.84%
TOTAL	15.62%	14.10%	12.83%	4.07%	7.40%	14.57%	5.36%	6.01%	20.03%	100%

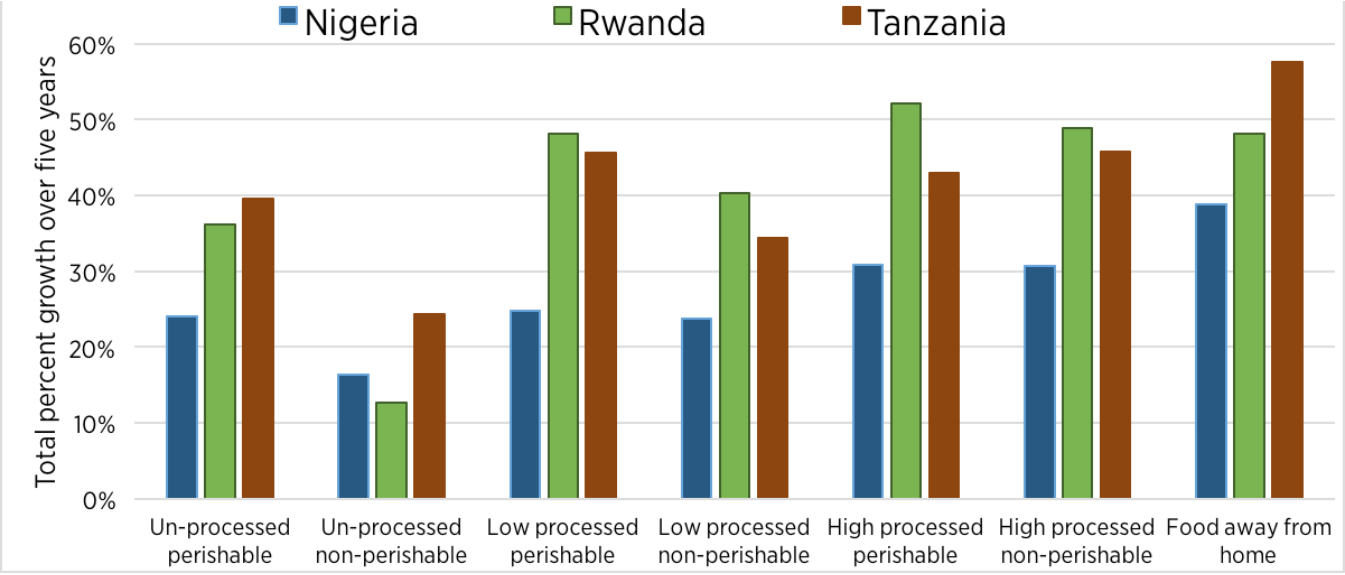
Source: Authors' estimations from LSMS data for each country

Figures 3.3 and 3.4 provide the same information as Figures 3.1 and 3.2, now for the commodity classification. Several results stand out. First, in Rwanda, animal products (poultry and eggs, other meat, and dairy) claim the top three rates of growth (Figure 3.3) but because their starting point is low, their contribution to total growth remains well under 10% in each case and 15% in total (Figure 3.4). These sectors could thus provide great opportunities for some firms, but will not at this point support broad growth.

Second, fruit and vegetables in Rwanda, taken as a group, show somewhat slower percentage growth but a much larger contribution to total growth; taken together, they account for 22% of all growth in food demand, well above any other group. Fruits and vegetables are also among the top contributors to growth in Tanzania.

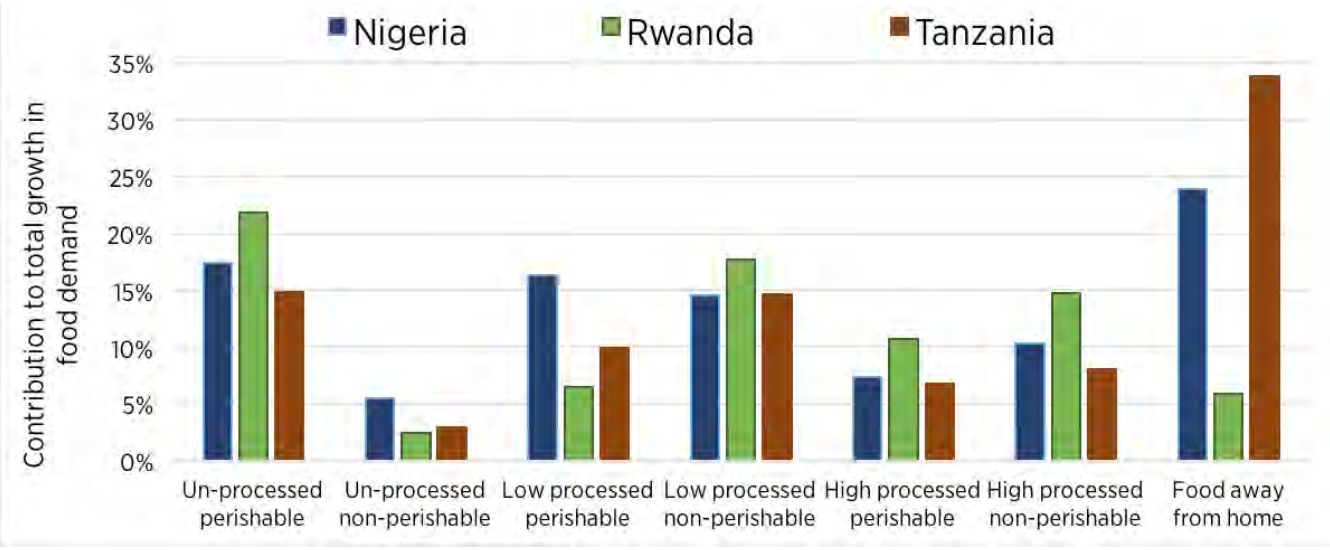
Third, and perhaps surprisingly, roots and tubers show strong growth prospects in Nigeria, based on the largest starting base of any group in consumer budgets (Table 3.8) and a surprisingly high elasticity

Figure 3.1 Total percent growth in market demand for food over five years, using processing x perishability groups, by country



Source: Authors' estimations from LSMS data for each country

Figure 3.2 Contribution of processing x perishability groups to total growth in market demand for food over next five years, by country

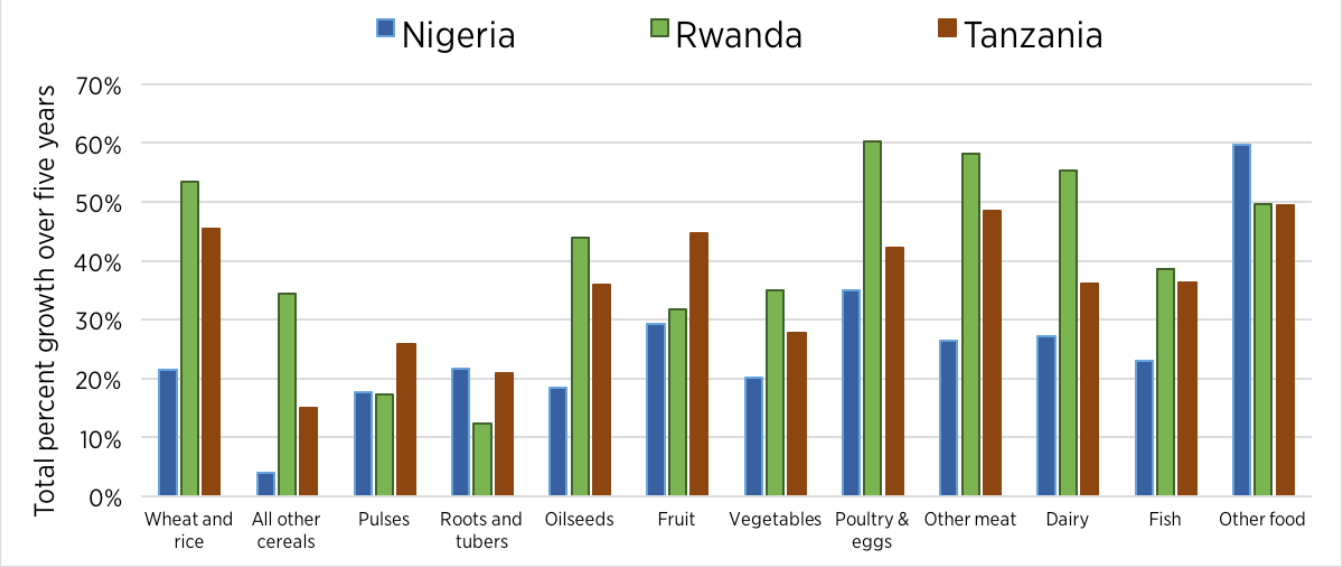


Source: Authors' estimations from LSMS data for each country

of demand (0.945). The result is that roots and tubers contribute as much to total growth as do wheat and rice. This finding stands in stark contrast to the conventional wisdom. Other cereals, on the other hand, show slow growth and contribute by far the least to total demand growth. Roots and tubers appear to have "staying power" in the diets of the region, even as incomes grow. Their prospects could be further enhanced with processes to add value to them after the farm, something that is already occurring with cassava and could be further promoted (Dalberg, 2015).

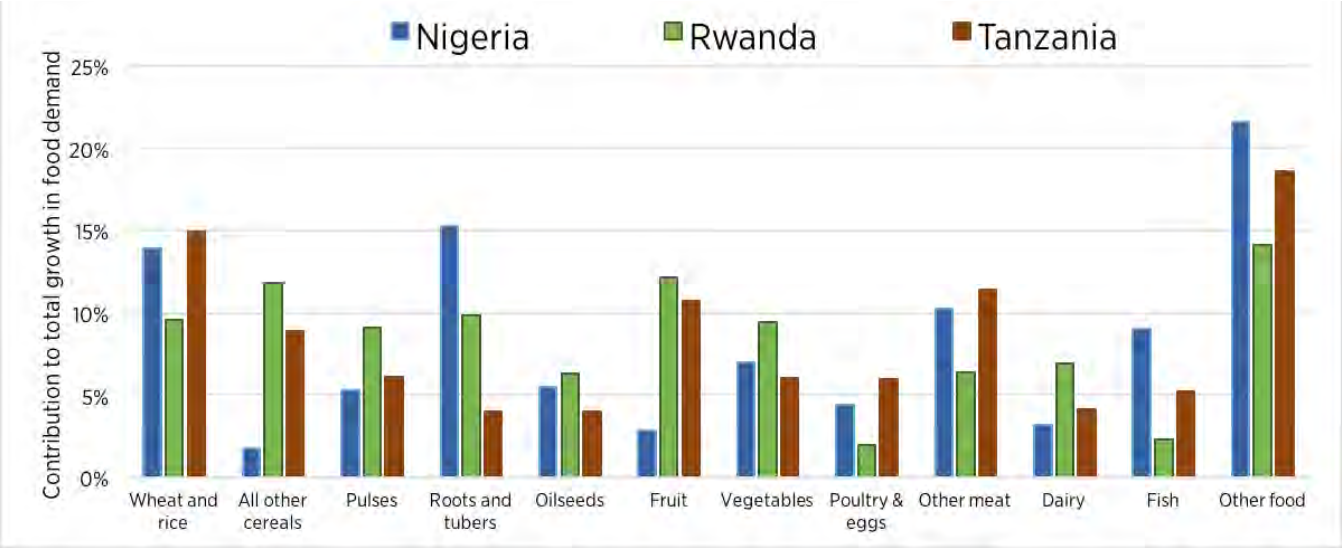
We now bring these two dimensions together—the rate of growth and the contribution to total demand growth—to generate a more comprehensive view of which types of foods are likely to see growth that is both rapid and quantitatively large. Such areas could potentially support the largest and fastest growth in employment, assuming that the countries' food systems can respond adequately to this demand and compete with imports. Figures 3.5–3.7 and Table 3.11 summarize this information.

Figure 3.3 Total percent growth in market demand for food over five years, using commodity groups, by country



Source: Authors' estimations from LSMS data for each country

Figure 3.4 Contribution of commodity groups to total growth in market demand for food over five years, by country



Source: Authors' estimations from LSMS data for each country

The figures are based on our processing/perishability/source classification, showing scatterplots of the percent growth in demand for each category (horizontal axis) by that category's contribution to total growth in demand over all foods (vertical axis). In each figure, the dashed grey lines indicate that median value of each of these dimensions. The intersection of these lines forms four quadrants, which we characterize as follows:

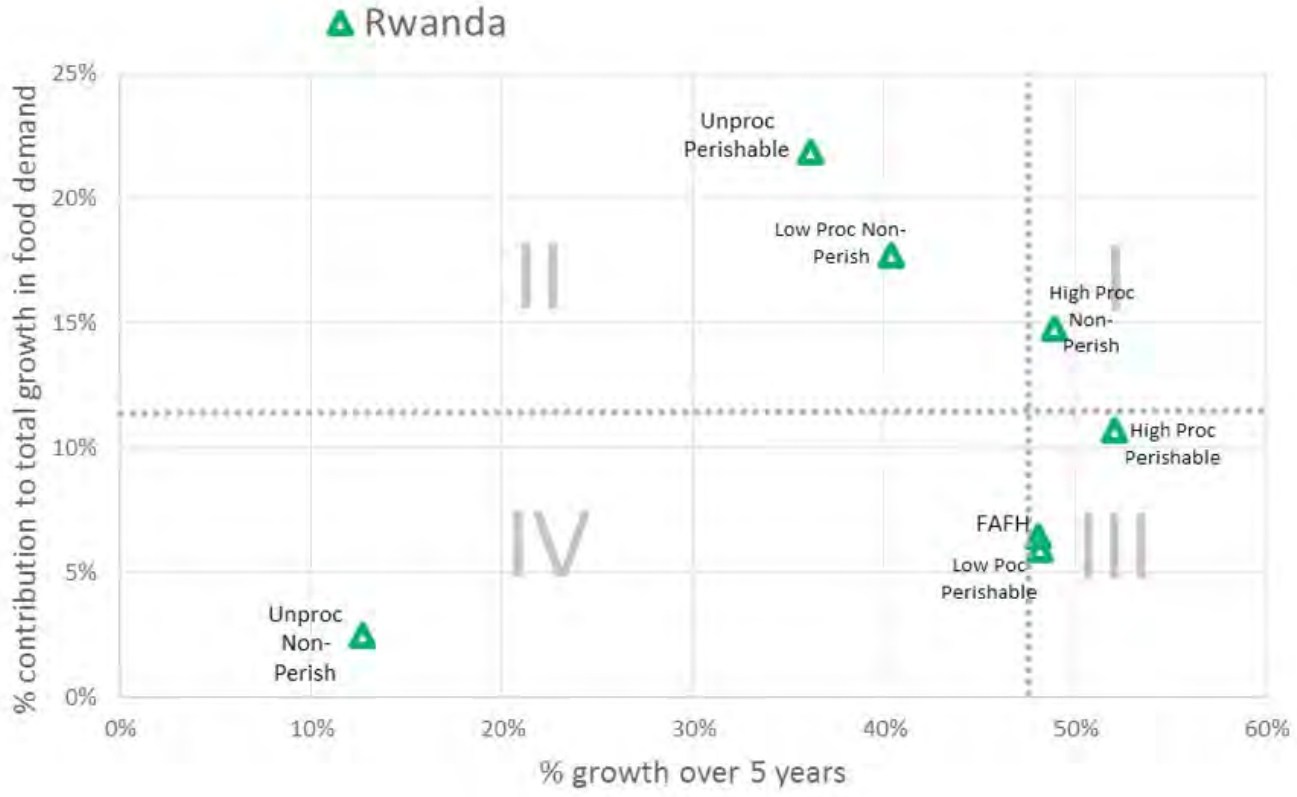
- "Best bets" (quadrant I): Fast growth from a substantial base = largest contribution to total demand growth:
- "The steady set" (quadrant II): Large footprint with moderate growth = meaningful contribution to total demand growth;
- "Promising but small" (quadrant III): fast growth from a small base = moderate contribution to total demand growth; and
- "The least promising" (quadrant IV): slow growth and small contribution to total demand growth.

Table 3.11 organizes these groups, indicates the specific types of foods that are driving growth in each, and indicates how dependent each type is on imports.

FAFH is the clear winner in both Tanzania and Nigeria (Figures 3.6 and 3.7) with much faster growth and higher contribution to growth than any other type. This sector is especially interesting from an employment perspective, for two reasons. First, it generates high value added even when using imported commodities, since these products have to be prepared and served to people, whether by street-side vendors or those located in markets, or companies that serve lunch on construction sites, or formal restaurants and hotels. Second, FAFH has strong linkages into a wide variety of other foods, providing a regular source of demand and serving as a motor of growth for them.

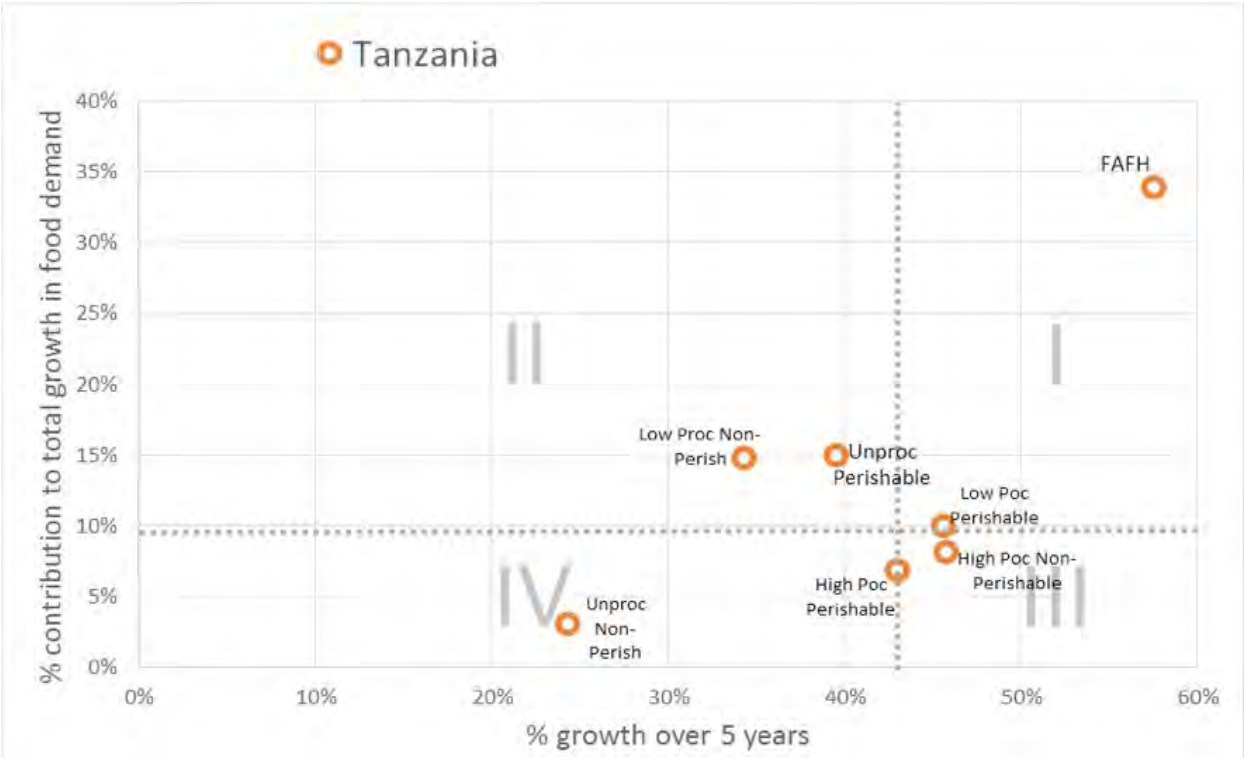
Rwanda (Figure 3.5) has several areas of promising growth but no single area that clearly outperforms the others. The fastest growing groups are high processed perishable (primarily bread and other bakery products, and dairy) and high processed non-perishable (primarily vegetable oils, drinks, sugar, and commercial alcohols). Yet unprocessed perishable (fruits and vegetables primarily) and low processed unperishable (rice and a wide range of flours from cereals and pulses) have higher contributions to total growth.

Figure 3.5 Scatterplot of % growth and % contribution to total growth of processing x perishability groups, Rwanda (next five years)



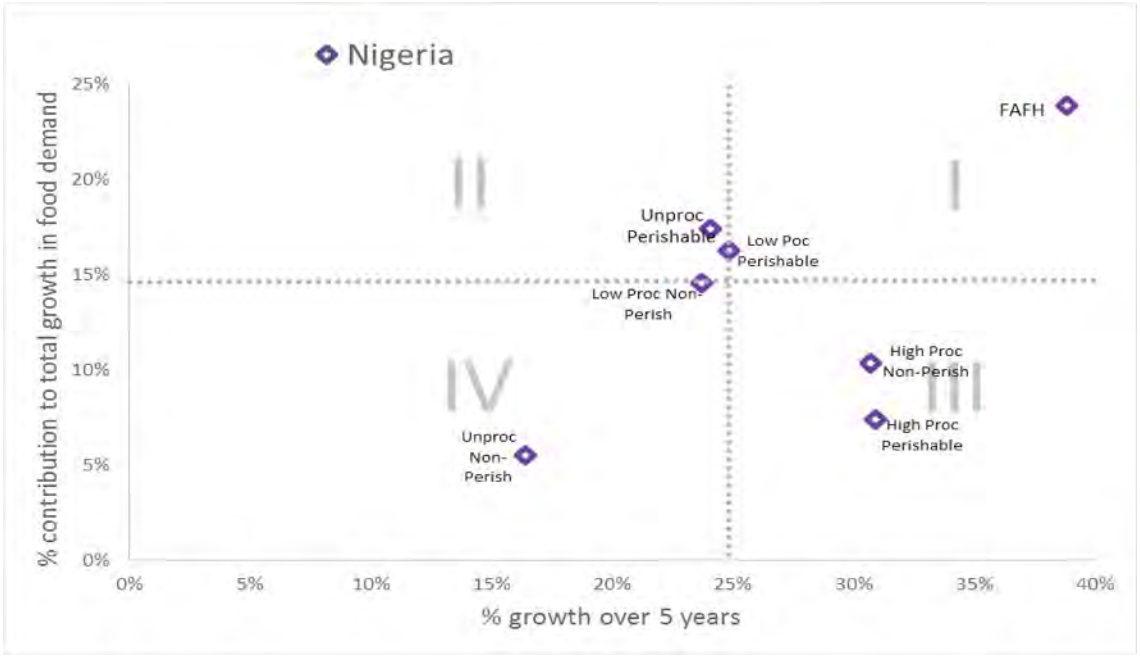
Source: Authors' estimations from LSMS data for each country

Figure 3.6 Scatterplot of % growth and % contribution to total growth of processing x perishability groups, Tanzania (next five years)



Source: Authors' estimations from LSMS data for each country

Figure 3.7 Scatterplot of % growth and % contribution to total growth of processing x perishability groups, Nigeria



Source: Authors' estimations from LSMS data for each country

The bottom line is that all four of these categories will provide reasonably robust growth to support employment. FAFH in Rwanda will likely be a minor contributor to overall growth over the next five years due to its currently low budget share, but its contribution is nearly certain to grow over time; over 10- and 15-year horizons, it should be quite an important sector.

In all three countries, unprocessed non-perishable foods—primarily coarse grains and pulses—show by far the slowest and smallest growth. On the other hand, low processed non-perishables (largely flours produced from these products) show reasonable growth rates from a large base. We see two implications. First, promoting the farming and trading of these crops for youth is unlikely to provide attractive returns on investment unless these programs include strong market linkages to processors. Second, helping SMEs in the milling of these grains to improve the quality of their flours, brand them, and expand their capacity, and helping youth enter these businesses in competitive fashion, could provide a large payoff.

3.5 IMPORTS: A THREAT AND AN OPPORTUNITY

Growing demand in the local economy is of little use if that demand is satisfied in large measure by increased imports. There is great concern in many quarters about this issue in Africa (Rakotoarisoa et. al., 2011). The common view is that food imports are high, and that they are rising rapidly and in unsustainable fashion. To the extent that the issue is examined, there is also a tendency to suggest that imports are especially dominant among rapidly growing high value products, including processed foods (Traub et al., 2015). This may be of special concern, as import domination in this area would have two negative effects: cutting-of local demand for raw product as ingredients in these foods and thus harming farmers, and reducing opportunities for the growth of local agribusinesses that would otherwise create employment and wealth. Because demand from processors can be organized, concentrated, and stable, its demise would be an especially large blow to African farmers, who need such organized demand so that they can progressively reduce their reliance on the small, irregular local markets they typically rely on.

Table 3.11 Classification of food groups by anticipated growth in consumer demand for food, contribution to total growth in food demand, and threats/opportunities from imports

Retail Food category as consumed by households	Country	Specific food items	Import reliance from outside the region *(import cost as share of retail expenditure)*	Comments	Possible programmatic focus
Best bets: Fast growth from a substantial base = large contribution to total demand growth					
High processed non-perishable	Rwanda	• Veg oils • Drinks, sugar • Commercial alcohols	• High (~ 40%) • Very high for sugar, less for drinks *per se* • Moderate (~ 20%)	• Potential for import substitution on veg oils?	Promotion of small-scale vegetable oil processing in rural areas and small towns, and linkages with youth farmers (this is already occurring in Tanzania).
FAFH	Tanzania	A wide range, with greatest contribution from: • Bread, rice, and other grains • Fruit • Drinks (alcoholic and non-) and sugar	• Nearly 100% on wheat, low on rice and other grains • Low (< 10%) • Very high for sugar in the drinks	• Breads and pastry have high value added even when using imported commodities. • Growth linkages into a wide range of value chains that provide the food ingredients	Improving business management skills and access to credit and other assets for women and youth involved in food preparation away from home; provide training to youth workers in formal FAFH establishments.
Low processed perishable	Tanzania	• Meats (poultry and other)	• Very low (~ 1%)	• Very rapidly growing sector • Strong growth linkages into coarse grains, fish or soya, and other products for animal feed	Support youth in small poultry operations with training, access to credit, and market linkages.
FAFH	Nigeria	A wide range, with greatest contribution from: • Drinks (alcoholic and non-) and sugar • Bread and rice • Roots & tubers	• High for sugar and some drinks • Very high for wheat (bread) • Very low	• High value added even when using imported foods. • Growth linkages into a wide range of value chains that provide the food ingredients	Improving business management skills and access to credit and other assets for women and youth involved in food preparation away from home; provide training to youth workers in formal FAFH establishments.

Table 3.11 (cont.) Classification of food groups by anticipated growth in consumer demand for food, contribution to total growth in food demand, and threats/opportunities from imports

Retail Food category as consumed by households	Country	Specific food items	Import reliance from outside the region (import cost as share of retail expenditure)	Comments	Possible programmatic focus
The steady set: Large footprint but more moderate growth = still meaningful contribution to total demand growth					
Unprocessed perishable	Rwanda	• Fresh veg • Fresh fruit • Fresh roots & tubers	• Very low (~ 5%) • Very low (~ 5%) • Very low (~ 1%)	• Great potential for regional trade; also exports to high income countries if properly organized, but much investment and training needed • Fruit has especially high growth potential	Support entrepreneurial youth farming in these products; support additional entrepreneurial training for these youth, as the objective for some (not all) may be to go into other, more profitable activities after earning and saving cash through the farming.
Low processed non-perishable	Rwanda	• Rice • Wide range of flours (maize, millet, sorghum, cassava, soya)	• Very low (~ 1%)	• High for rice, ~ 35% • Lower but meaningful for other flours, ~20%	Support groups of youth farmers in these grains to add processing capacity to satisfy rising demand even in rural areas and small towns for purchase of the product already in processed form.
Unprocessed perishable	Tanzania	• Fresh vegetables • Fresh fish • Fresh fruit • Fresh roots & tubers	• Very low (~ 1%) • Very low (~ 1%) • Very low (~ 1%) • Very low (~ 1%)	• Great potential for regional trade; also exports to high income countries if properly organized • Fruit has especially high growth potential	Support entrepreneurial youth farming in these products; support additional entrepreneurial training for these youth, as the objective for some (not all) may be to go into other, more profitable activities after earning and saving cash through the farming.
Low processed non-perishable	Tanzania	• Rice • Drinks, sugar • Maize meal and other meals	• Very low (< 5%) • Low (< 10%) • Very low (~ 1%)		Support groups of youth farmers in these grains to add processing capacity to satisfy rising demand even in rural areas and small towns for purchase of the product already in processed form.
Low processed non-perishable	Nigeria	• Rice • Drinks, sugar	• Low (< 10%) • Very low	• Nigeria has low import share in sugar unlike other two countries	Support groups of youth farmers in these grains to add processing capacity to satisfy rising demand even in rural areas and small towns for purchase of the product already in processed form.
Unprocessed perishable	Nigeria	• Fresh roots & tubers • Fresh vegetables	• Very low (~ 1%) • Very low (~ 1%)	• Great potential for regional trade; also exports to high income countries if properly organized • Fruit has especially high growth potential	Support entrepreneurial youth farming in these products; support additional entrepreneurial training for these youth, as the objective for some (not all) may be to go into other, more profitable activities after earning and saving cash through the farming.

Table 3.11 (cont.) Classification of food groups by anticipated growth in consumer demand for food, contribution to total growth in food demand, and threats/opportunities from imports

Retail Food category as consumed by households	Country	Specific food items	Import reliance from outside the region (import cost as share of retail expenditure)	Comments	Possible programmatic focus
Promising but small: fast growth from a small base = moderate contribution to total demand growth					
High processed perishable	Rwanda	• Bread and bakeries • Dairy	• Very high for wheat • Low (< 10%)	• Though wheat largely imported, much value added and employment possible from bakeries production • Dairy has active regional market (Tanzania, Uganda, Kenya)	Assistance to entrepreneurial youth dairy farmers; assistance to youth entering the bakery sector; training of youth for entry into wage employment in this sector. All being mindful of the small starting base of these sectors.
Low processed perishable	Rwanda	• Fresh meat other than poultry	• Very low (~ 1%)	• Very rapidly growing sector • Strong growth linkages into coarse grains, fish or soya, and other products for animal feed	Programs for entrepreneurial youth to profitably increase their holdings of small ruminants, with linkages to market outlets.
FAFH	Rwanda	• Mostly drinks	• Potentially large	• Expenditure elasticity is very high on FAFH in Rwanda. So over 10-15 years (rather than the 5 considered here), would make far larger contribution to total growth	Improving business management skills and access to credit and other assets for women and youth involved in food preparation away from home; provide training to youth workers in formal FAFH establishments.
High processed non-perishable	Tanzania	• Veg oil • Drinks	• High (~ 40%) • High on fruit juices and non-beer alcohol, low on others	• Potential for import substitution on veg oils? • Sugar production coming online, so import share could fall substantially—large growth potential	Promotion of small-scale veg oil processing in rural areas and small towns, and linkages with youth farmers (note this is already occurring in Tanzania)
High processed perishable	Tanzania	• Bread and bakeries • Dairy	• Very high for wheat • Low (~ 5%)	• Though wheat largely imported, much value added and employment possible from bakeries production • Dairy has active regional market (Tanzania, Uganda, Kenya)	Assistance to entrepreneurial youth dairy farmers; assistance to youth entering the bakery sector; training of youth for entry into wage employment in this sector. All being mindful of the small starting base of these sectors.
High processed non-perishable	Nigeria	• Drinks (coffee, tea, cocoa, others) • Veg oils	• High (~ half) • Very low (~ 1%)		Promotion of small-scale veg oil processing in rural areas and small towns, and linkages with youth farmers (note this is already occurring in Tanzania)
High processed perishable	Nigeria	• Bread and bakeries • Dairy	• Very high for wheat (~ 50%) • Moderate (~ 20%)	• Though wheat largely imported, much value added and employment possible from bakeries production	Assistance to entrepreneurial youth dairy farmers; assistance to youth entering the bakery sector; training of youth for entry into wage employment in this sector. All being mindful of the small starting base of these sectors.
The least promising: slow growth and small contribution to total demand growth					
Unprocessed non-perishable	All three countries	• Coarse grains and pulses	• Very low for pulses • Generally low but variable for coarse grains	• Lowest growth prospects for direct purchase • Much stronger for input to poultry and milling	Should not be a priority focus area for programmatic interventions.

3.5.1 Current Import Levels

We suggest that the empirical pattern of imports is not necessarily cause for alarm. We analyze this by expressing the value of imports from Comtrade data as the ratio of their cost, insurance, and freight (CIF) value to the retail value of food expenditure from the LSMS surveys. Comparing a CIF value to a retail value acknowledges a key fact: an imported food commodity can have a great deal of value added to it in the local economy through processing, packaging, wholesaling, distribution, and retailing. For example, imported wheat must be locally milled and either packaged for sale at retail or processed into bread and other bakery items. Similarly, a portion of imported vegetable oil may be used in the manufacture of other foods or in the production of FAFH, both of which entail high levels of local value added. And even goods imported in processed form have to be wholesaled, transported, and sold at retail, generating some level of income for local entrepreneurs.

Tables 3.12-3.14 show the basic results. Table 3.12 shows the ratio of CIF value of imports to consumer expenditure on purchased food, by food commodity group, while Table 3.13 does the same by processing /perishability/source group. Consumed own production is not included in the denominator in these tables, in order to focus just on purchased foods.

Several results stand out. First, the overall CIF value of imports relative to consumer expenditure on purchased food is only 8%, ranging from a low of little above zero for roots and tubers, and pulses, to 17% for dairy and 16% for wheat and rice (driven largely by wheat). Excluding Nigeria, which has the largest economy and the lowest import share, the import share for the other six countries rises to 15%.

Second, Rwanda is the most import-dependent of the three focus countries, at 22% of the value of all purchased food (Mozambique is by far the most import dependent across the seven, at 36%). Tanzania's import share stands at only 11%.

Third, import shares are highest for wheat and rice (dominated by wheat), and for dairy, fish, and "other foods". Import shares for each of these, however, vary sharply across countries. For example, Zambian dairy imports equal 30% of the retail value of all dairy expenditures in the country, while Tanzania and Uganda spend only 5% in this way. Fish imports in Uganda, Tanzania, and Malawi are only about 1% of consumer expenditure on fish, while in Rwanda this share is 20%, the highest of the three countries.

Fourth, oilseeds—much of them in the form of vegetable oils—show high import shares in every country except Nigeria. This represents an enormous potential growth market in the other countries, if they can develop a production and processing sector able to compete with imports.

Fifth, imports in Tanzania are heavily concentrated among two commodities: vegetable oil and wheat. Import shares in all other groups are typically well below 10%, suggesting that, under prevailing economic conditions and policy, local products are competing strongly with imports.

Sixth (Table 3.13), unprocessed perishable foods, largely fresh produce and roots & tubers, show extremely low import shares, averaging 1% and not exceeding 4% in any country. This very low figure almost certainly masks substantially higher regional trade in these commodities, which is more likely to go unrecorded than international trade that enters the country through ports. Yet regional trade among economies that are on a broadly similar playing field is clearly a positive factor for these economies, not a negative factor. Expanding such trade, in fact, could provide a major boost to growth in each country.

Seventh, the highest import share (17%) is for high processed non-perishable items, which are primarily vegetable oils and sugar, whether imported directly or embodied in products such as fruit juices. Nigeria's share is only 15% in this category, but shares for other focus countries are 61% in Rwanda and 57% in Tanzania.

Eighth, import values for all other processed foods are far lower, at 6% on average, and lower than for unprocessed non-perishable commodities (primarily wheat). Note that Tanzania has especially low import values for these other processed foods, at only 1% to 4%. Rwanda's imports are more steadily high across all but the unprocessed perishable category.

Table 3.12 Ratio of CIF value of imports to consumer expenditure on purchased food, by food commodity group (average, 2008-2012)

Commodity Groups	Rwanda	Mozam-bique	Nigeria	Zambia	Uganda	Tanzania	Malawi	All 7 countries
Wheat and rice	**54%**	74%	**13%**	9%	52%	**29%**	47%	16%
All other cereals	**22%**	32%	**3%**	7%	11%	**6%**	6%	5%
Pulses	**4%**	1%	**0%**	8%	0%	**1%**	0%	0%
Roots and tubers	**1%**	4%	**0%**	3%	0%	**0%**	1%	0%
Oilseeds	**43%**	103%	**1%**	58%	128%	**57%**	35%	9%
Fruit	**5%**	102%	**4%**	17%	8%	**3%**	5%	5%
Vegetables	**39%**	21%	**4%**	22%	9%	**4%**	9%	5%
Poultry & eggs	**15%**	19%	**1%**	4%	5%	**2%**	2%	2%
Other meat	**7%**	12%	**1%**	4%	1%	**1%**	1%	1%
Dairy	**8%**	191%	**18%**	30%	5%	**5%**	21%	17%
Fish	**20%**	15%	**13%**	5%	1%	**1%**	1%	11%
Other food	**45%**	32%	**12%**	20%	20%	**12%**	8%	13%
Overall	**22%**	36%	**6%**	13%	16%	**11%**	11%	8%

Source: Comtrade data at six-digit ISIC code level, means for 2008 - 2012; LSMS data on expenditure from latest surveys; all values in 2011 real PPP USD

Table 3.13 Ratio of CIF value of imports to consumer expenditure on purchased food, by processing /perishability/source group (average, 2008-2012)

Processing Groups	Rwanda	Mozam-bique	Nigeria	Zambia	Uganda	Tanzania	Malawi	7 Countries
Unprocessed perishable	**3%**	4%	**0%**	3%	1%	**1%**	1%	1%
Unprocessed non-perishable	**44%**	96%	**15%**	14%	70%	**70%**	69%	10%
Low processed perishable	**8%**	22%	**7%**	3%	0%	**1%**	0%	6%
Low processed non-perishable	**17%**	38%	**6%**	5%	6%	**4%**	4%	6%
High processed perishable	**21%**	35%	**5%**	24%	6%	**2%**	15%	6%
High processed non-perishable	**61%**	98%	**15%**	65%	117%	**57%**	26%	17%
Overall	**22%**	36%	**6%**	13%	16%	**11%**	11%	8%

Source: Comtrade data at six-digit ISIC code level, means for 2008–2012; LSMS data on expenditure from latest surveys; all values in 2011 real PPP USD

3.5.2 Recent trends in imports and exports

Figure 3.8 shows recent import and export trends for all food in the three focus countries, broken by regional trade, trade outside the region, and total trade.[8]

Two points can be highlighted from Figure 3.8. First, we see that Rwanda and Nigeria are regular net importers of food, while Tanzania alternates between being a net importer and a net exporter. Second, all trade is rising, and food exports are keeping pace with food imports in each country; Rwanda showed a deterioration in its food trade position during 2009 and 2010, but increases in exports have kept pace with imports since that time. This clearly does not paint an alarming picture for these countries' food overall position on food trade.

What about the countries' trade in non-traditional processed food imports? We ask this question because this segment is growing so rapidly in consumer diets, and it is imperative that the countries' agribusiness sectors succeed in capturing much of this growth in order to generate employment for their youth. Figure 3.9 uses the same data as Figure 3.8, but focuses on trade of processed foods excluding coffee, tea, cocoa, sugar and their products. Low- and high processed foods are jointed together in the graph.

The figure shows that Rwanda runs a large trade deficit in these products, both regionally and with the rest of the world, while Nigeria is running a very large deficit with rest of world. Tanzania, on the other hand, runs a surplus on these products in the region, and a deficit with the rest of the world, while being near balance overall.

Two summary points need to be made in interpreting Figure 3.9. The first is that, even when we ignore the countries' traditional large exports, the picture that emerges is not uniformly negative. For example, Tanzania does quite well on the processed food products that are rapidly growing in consumer diets. Second, as shown in Table 3.13, this trade remains small compared to food expenditure by local consumers.

8 We exclude 2011 in Nigeria because of data problems showing huge and non-credible increases in imports, with a return to normal trend in 2012.

3.5.3 Emerging evidence on the response of local agribusiness to the growth in demand for processed foods

The patterns above, showing modest import shares for processed foods other than vegetable oils and sugar, are consistent with emerging data on the role of local food processing firms in supplying urban markets (Ijumba et al., 2015; Snyder et al., 2015; Liverpool-Tasie et al., forthcoming). This recent research finds extremely vigorous response from local firms in three cities of Tanzania (Dar es Salaam, Arusha, and Mwanza) and two cities of Nigeria (Ibadan and Kaduna). In each country, local firms dominate a wide range of product categories in terms of number of firms and number of products. This local dominance in each country is uneven. In Tanzania, for example, local products appear to dominate processed grains (meals and packaged rice) and poultry, and they appear to be competitive in dairy but to be outnumbered in fruit juices. The World Bank reports that the number of off-farm businesses expanded by 23% in Tanzania between 2008/9 and 2010/11 (World Bank, 2014). While these findings are not specific to firms in the agrifood system, they are consistent with the findings of these other studies regarding the broad competitiveness of local food processing firms in the local market. In Nigeria, the dominance of local firms is strongest in Kaduna, in the north, but is also seen in Ibadan.

This new research also shows that, in both countries, locally processed foods are widely present in modern retail outlets, not just in traditional outlets. This finding applies to products produced by small- and medium size companies, not just large companies. Finding large amounts of processed foods from small- and medium size local companies on the shelves of supermarkets is likely to be surprising to many casual observers of these economies. It suggests much larger expansion of such companies than is commonly appreciated.

We stress that the expansion of this sector is new, that the situation is dynamic, and that the threat of takeover by large local companies—who will generate less employment per unit of output than small- and medium firms—and by imports is real. To date, however, this evidence suggests that the response of local firms has been quite strong. Policies and programs that facilitate access to capital, technology, and training for these firms will be central to ensuring that they continue to prosper and, in so doing, that they continue to provide growing employment.

Figure 3.8 Imports and exports in Rwanda, Nigeria, and Tanzania, 2008–2012 ('000 USD PPP/year, 2011 base)

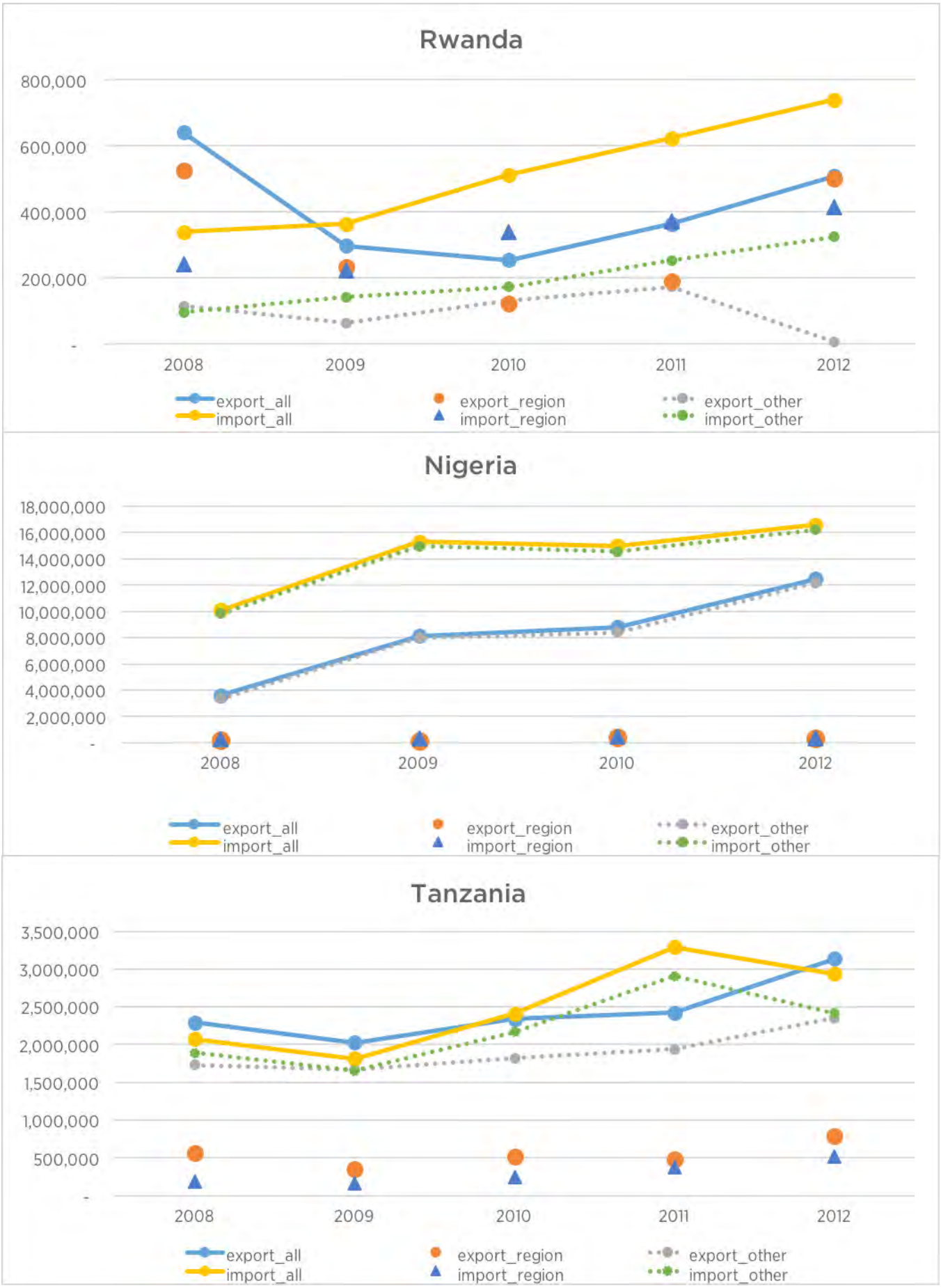


Figure 3.9 Regional and "rest of world" imports and exports of processed foods in Rwanda, Nigeria, and Tanzania, net of coffee, tea, cocoa, sugar, and their products, 2008-2012 ('000 USD PPP/year, 2011 base)

3.6 IMPLICATIONS FOR THE EVOLUTION OF EMPLOYMENT

3.6.1 Projections over five years

To provide insights on how the projected growth in demand for different types of foods is likely to play-out in employment growth, we adapted methods from Tschirley et al. (2015b). A full description of methods, and the spreadsheets used to compute the results in this paper, are available on request. The essential change from the earlier work is to express all jobs in terms of "full time equivalent" (FTE) rather than number of jobs. We do this by using data from the LSMS employment modules on months worked in the past year, weeks worked in the past month, and hours worked in the past week. This data is collected for every job listed by every working-age adult. One FTE is then defined as working 40 hours per week over all 4 weeks of the month and all 12 months in the year. The FTE of any one job is computed as the actual number of hours worked as a share of this standard.

We use an FTE approach to capture the fact that different jobs occupy differing amounts of a person's time. Farming, due to its seasonal nature, generates far fewer FTEs per job than other types of work. In our three focus countries, FTEs in farming range from 0.26 in Tanzania to 0.66 in Nigeria, while jobs elsewhere in the agrifood system show ratios of 0.44 up to 0.92, with most in the range of 0.7 to 0.9.

A second change from the earlier methods was to use 1990-2010 historical data from each country to estimate country-specific relationships between the growth of per capita income and the decline in the share of labor in farming. The coefficients used in this analysis thus capture the historical experience of each country over the past 20 years. Details on this aspect were given in section 3.2.

Finally, we used economic growth projections specific to each country. These projections, together with projected population growth and implied per capital GDP growth, are given in Table 3.14.

Results for each country are found in Tables 3.15-3.17. Each table shows the number of jobs (in FTE terms) in each segment of the economy from the latest LSMS survey, the share in all employment, the projected FTE numbers and shares in five years' time, the percent growth in jobs in each segment, and that segment's projected contribution to total job growth.

Results are as follows. First, the fact that labor is not moving reliably out of farming in Nigeria essentially locks that country into its current structure of employment. As a result, employment in the off-farm portions of Nigeria's agrifood system grows relatively slowly (only about as fast as farming itself) and contributes only about 19% to total job growth, despite accounting for 24% of all employment at the start of the projection. Employment grows fastest and contributes most to total job growth outside the agrifood system.

Second, Rwanda's rapid exit out of farming—by three percentage points in five years—allows the off-farm portions of the agrifood system to add jobs at a rate exceeding their current share of jobs: Currently accounting for only 8% of employment, these segments (food manufacturing; food marketing, transport, and other services, and food preparation away from home) account for 11% of all projected job growth. Yet as in every other country, it is the economy outside the agrifood system that accounts for most job growth, in Rwanda's case 63%.

Third, the robust but somewhat slower exit out of farming in Tanzania places it, as in much of the analysis in earlier portions of this chapter, between Nigeria and Rwanda: the off-farm segments of the agrifood system show strong growth in employment and contribute 22% to total employment growth—equal to their current employment shares. Farming accounts for only 31% of job growth, while the rest of the economy accounts for 46%.

Table 3.14 Projected growth rates in real GDP, population, and real per capita GDP for use in employment projection model, 2016-2021

Indicator	Nigeria	Rwanda	Tanzania
IMF Projected GDP growth rate	4.03%	7.0%	7.0%
Projected annual population growth	2.54%	2.26%	3.05%
Implied *per capita* GDP growth	1.76%	4.74%	3.95%

Table 3.15 Projected change in job numbers (FTE) by segment of the economy, over next five years (Nigeria)

Segment of the economy	Current		In 5 Years		Total % growth in jobs	Contribution to total job growth
	# of jobs ('000)	Share	# of jobs ('000)	Share		
Non-AFS	21,865	0.407	25,151	0.413	15%	46%
Farming, own and wage labor	18,772	0.349	21,280	0.349	13%	35%
Food manufacturing	2,467	0.046	2,753	0.045	12%	4%
Marketing, transportation, & other services	10,000	0.186	11,005	0.181	10%	14%
Food preparation away from home	681	0.013	783	0.013	15%	1%
Total	**53,785**	**1.0**	**60,972**	**1.0**	**13%**	**100%**

Source: Authors' calculations from projection model

Table 3.16 Projected change in job numbers (FTE) by segment of the economy, over next five years (Rwanda)

Segment of the economy	Current		In 5 Years		Total % growth in jobs	Contribution to total job growth
	# of jobs ('000)	Share	# of jobs ('000)	Share		
Non-AFS	1,179	0.381	1,410	0.408	20%	63%
Farming, own and wage labor	1,664	0.538	1,757	0.508	6%	25%
Food manufacturing	40	0.013	48	0.014	20%	2%
Marketing, transportation, & other services	185	0.060	214	0.062	16%	8%
Food preparation away from home	26	0.008	31	0.009	19%	1%
Total	**3,095**	**1.0**	**3,460**	**1.0**	**12%**	**100%**

Source: Authors' calculations from projection model

Table 3.17 Projected change in job numbers (FTE) by segment of the economy, over next five years (Tanzania)

Segment of the economy	Current		In 5 Years		Total % growth in jobs	Contribution to total job growth
	# of jobs ('000)	Share	# of jobs ('000)	Share		
Non-AFS	3,920	0.356	4,744	0.371	21%	46%
Farming, own and wage labor	4,708	0.428	5,269	0.412	12%	31%
Food manufacturing	287	0.026	336	0.026	17%	3%
Marketing, transportation, & other services	1,691	0.154	1,959	0.153	16%	15%
Food preparation away from home	395	0.036	478	0.037	21%	5%
Total	**11,003**	**1.0**	**12,786**	**1.0**	**16%**	**100%**

Source: Authors' calculations from projection model

Fourth, despite varying rates of exit from farming, the contribution of farming to total job growth ranks second to the non-agrifood system portion of the economy in every country. Farming's contribution to new jobs ranges from 25% in Rwanda to 31% in Tanzania and 35% in Nigeria. These estimates are actually higher than those found by two recent authors examining historical data. McMillan and Harttgen (2014) used Demographic and Health Surveys (DHS) data from 24 countries in SSA to examine structural movements of labor. Their results suggest that, between 1990 and about 2010, farming accounted for only 18% of all new jobs.[9] They did, however, find enormous variation across countries, with farming's contribution to new jobs ranging from only 8% in Kenya to 68% in Rwanda. In this latter case, Rwanda actually had the *most rapid* exit from farming (consistent with this paper) but this started from an extremely high base (92%) in 1990. With lower shares of the workforce now in farming, similar rates of exit dramatically reduce farming's contribution to new jobs. Fox et al. (2013), using different data and different methods, suggest that 30% of new jobs in SSA between 2005 and 2010 came from farming.[10] Note also that Tschirley et al. (2015), using methods similar to those in this paper, estimated that farming would contribute 34% to new job growth between 2010 and 2025 in East and Southern Africa.

3.6.2 Implications for labor productivity

A fundamental characteristic of the structural transformation of economies—which this projection scenario is based on—is that it allows overall labor productivity to grow faster than its growth in any single sector of the economy. It accomplishes this feat by moving labor from low-productivity sectors to high productivity sectors. As a result, even if labor productivity is not growing in any single sector, overall labor productivity does grow because more people work in the higher productivity sectors. Two things happen if labor does not move across sectors. First, overall growth is lower. Second, inequality either increases, or decreases less than it otherwise would. This inequality is a straightforward result of labor being trapped in sectors of low productivity–exit of labor from these sectors would eventually put upward pressure on wages in those sectors, and downward pressure on wages in the high productivity sectors, leading to less dispersion (less inequality) in returns to labor across sectors.

Farming's contribution to new jobs ranges from 25% in Rwanda to 31% in Tanzania and 35% in Nigeria.

These patterns play out in this analysis through the fact that labor is expected to exit farming at differing rates in the three countries. Tables 3.15-3.17 show that farming's share of employment falls three full percentage points in Rwanda over five years, about half that (1.6 points) in Tanzania, and not at all in Nigeria. In other words, structural transformation is expected to proceed most rapidly in Rwanda, next in Tanzania, and little if at all in Nigeria.

The productivity and inequality effects of these patterns are shown in Table 3.18. Four points stand out. First, in all countries, output per worker grows slower in farming than in any other sector. This is a common feature of structural change in low income countries, when technology use in farming remains low. Investment in the generation and delivery of improved farm technology can raise the rate of growth in labor productivity, and it is imperative that this happen, but it is very unlikely at this stage of development to drive productivity growth higher than that in the off-farm segments of the economy.

Second, output per worker in farming grows far faster in Rwanda than in Tanzania, and it grows faster in Tanzania than in Nigeria; in the latter it grows only 3% in five years. This pattern is a direct result of the more rapid exit out of farming in Rwanda and the lack of any exit in Nigeria.

Yet our third point is that output per worker in farming in Rwanda is extremely low (about 40% of Tanzania and less than 25% of Nigeria) and, despite its rapid percentage growth, farming makes-up little of the productivity gap with the other two countries over the projection period. This pattern reflects the rural population density of that country and its early stage of development. Only after structural transformation has proceeded much further, and farming's share of employment has fallen much further, is the productivity gap likely to start closing.

9 McMillan and Harttgen do not report this specific number; we calculate it from data in Table 3.7, Average One.

10 Using data from Fox et al. (2013; Figures 3.4 and 3.6), we compute that farming contributed only 21% of new jobs, not the 30% reported in the text.

Table 3.18 Output per worker by sector of agrifood system, at start and end of projection period, and indicators of change

Sector of agrifood system	Output per worker		% change	Ratio to per capita GDP growth
	Start	5 years		
Nigeria				
Farming, own and wage labor	5.66	5.85	1.03	0.38
Food manufacturing	20.41	23.62	1.16	1.72
Food marketing and transport	7.87	8.93	1.14	1.49
Food prep away from home	28.83	34.79	1.21	2.27
Rwanda				
Farming, own and wage labor	1.24	1.43	1.16	0.61
Food manufacturing	9.25	11.37	1.23	0.88
Food marketing and transport	4.39	4.99	1.19	0.73
Food prep away from home	2.72	3.37	1.24	0.92
Tanzania				
Farming, own and wage labor	3.21	3.48	1.08	0.39
Food manufacturing	18.04	22.44	1.24	1.14
Food marketing and transport	4.04	4.94	1.22	1.04
Food prep away from home	8.35	10.87	1.30	1.41

Source: Authors' calculations from LSMS data and projection model

Fourth, and again driven by rates of exit from farming, inequality increases the least in Rwanda and the most in Nigeria. This can be seen in the final column, which shows that output per worker in farming in Nigeria rises at less than half (38%) of the rate of growth of overall per capita GDP, while output per worker in the rest of the agrifood system rises at between 149% of the overall rate (food marketing and transport) and 227% of the overall rate (FAFH). In Rwanda, on the other hand, output per worker in farming grows at 61% of the overall rate of the economy, while the fastest growing sector, FAFH, grows at 92%. Because farming starts with the lowest output per worker and grows the slowest, inequality increases in Rwanda, but it does so to a far lesser degree than in Nigeria.

Note also that output per worker in every sector in Rwanda grows more slowly than overall per capita GDP growth. This result is made possible (as explained above) by the country's rapid exit out of farming. Tanzania lies in the middle ground in all these respects, with more unequal growth than Rwanda but less unequal than Nigeria.

3.6.3 Gender and youth dimensions

The analysis above suggests that Tanzania and Rwanda are likely to see the biggest shifts in employment of the three countries, with Nigeria being somewhat locked-in to its employment structure by the slow exit from farming. What will be the implications for women and youth of the employment shifts in Rwanda and Tanzania? What opportunities are being missed in Nigeria due to its slow transformation?

Table 3.19 shows the percent female, youth (age 15-24), and age 25-40 in each of our job segments, with boxes around the segments that are most female and youngest. One key pattern is that, in Tanzania and Nigeria, the post-farm segment of the agrifood system is the most female of any segment in the economy. This is especially the case for food manufacturing and food preparation outside the home: 90% of FAFH employment in Nigeria is female, and 71% in Tanzania. This suggests that improving the productivity of micro- and small enterprises in food manufacturing and food preparation, and facilitating the entry of women from farming into these activities, could have high payoffs to gender equity in these two countries.

In Rwanda, on the other hand, farming is the most female sector, followed by food manufacturing. Given that Rwanda's farm population share appears to be falling fairly rapidly, the implication of this pattern is that female farm-leavers especially need targeted assistance to enter into other segments of the economy.

Youth are more broadly distributed than women across the segments of the economy in each country; targeting youth by economic activity is thus more difficult than it is for reaching women. To the extent that they predominate in any one segment, however, they do so in farming in both Tanzania and Nigeria.

Youth are sharply under-represented in both the post-farm agrifood system and the non- agrifood system portion of the economy in both of these countries. Yet this changes among the next oldest cohort: those 25-40 have, in every country, moved strongly into the off-farm portion of the agrifood system and, especially in Tanzania and Rwanda, into the economy outside the agrifood system. This movement is especially sharp in Tanzania and Nigeria. In Tanzania, for example, the ratio of youth in farming to youth in food manufacturing is about 3:1, and this falls to 0.7:1 in the next age cohort. In Nigeria, the ratio among youth is about 1.6:1, falling to about 0.65:1 among those age 25-40.

The implication of this pattern is that youth in all three countries start in farming due to lack of other alternatives, but look to leave farming as soon as they can arrange better options. Mixed strategies are needed to (a) increase the knowledge, productivity, and market engagement of those youth who have the predilection and ability to be good farmers, and (b) provide training and other assistance to increase the profitability of off-farming activities for the many youth who will end up leaving the sector.

Table 3.19 Gender and youth composition of different employment segments

	Own farming	Farm labor	Food mfg	Food mktg	FAFH	All AFS	Non-AFS
Tanzania							
% female	52%	39%	62%	48%	71%	50%	37%
% youth	35%	30%	11%	20%	22%	32%	19%
% 25-40	35%	42%	50%	52%	52%	38%	50%
Rwanda							
% female	58%	55%	53%	48%	44%	56%	37%
% youth	25%	27%	24%	27%	25%	26%	29%
% 25-40	43%	44%	46%	52%	49%	44%	49%
Nigeria							
% female	38%	35%	82%	62%	90%	48%	45%
% youth	24%	9%	15%	9%	11%	19%	11%
% 25-40	33%	36%	51%	43%	50%	37%	45%

Note: Youth are all individuals age 15-24. Source: authors' calculations from LSMS data

3.7 SUMMARY AND CONCLUSIONS

Chapter 3 has examined the structure of consumer demand for food, projecting how it is likely to change over the next five years, and linking these consumption changes to changes in future employment. Consistent with the findings of Chapter 2, the analysis in Chapter 3 confirms the major dynamics underway in African employment: labor is moving sharply out of farming as the economies transform, yet farming remains extremely important for livelihoods and economic growth in all these countries. The off-farm agrifood system is growing very rapidly in percentage terms and will offer important opportunities for new businesses, but it will not match farming in the absolute level of new job creation for at least ten years.

Several results from Chapter 3 are especially relevant for The MasterCard Foundation programming. First, food away from home (FAFH) should generate high quality jobs for youth in all three countries, even if the absolute number of jobs they will support will not be as large as in other sectors. Because the food away from home sectors are much larger in Nigeria and Tanzania than in Rwanda, the former two may present opportunities to focus activities and programming in this sector. This rationale is further supported by the fact that FAFH in these two countries not only offers the most rapid and largest growth in demand of any type of food, but also offers the most rapid growth in output per worker in each country; wages in these sectors (or returns to labor in own employment) are thus likely to be attractive and rapidly improving.

Second, food manufacturing in Tanzania offers the highest output per worker, the second-highest rate of growth in output per worker, and fairly large employment absorption, at 5% of all new jobs. In this respect, food manufacturing becomes a potentially attractive area of focus for national and regional stakeholders and The MasterCard Foundation in Tanzania. In all three countries, results suggest that food manufacturing should offer high quality jobs, but with a much larger number of jobs in Tanzania than in Rwanda and Nigeria.

Third, despite the relatively rapid growth in output per farm worker in Rwanda, the very low absolute levels of output mean that it is only likely to be an attractive option for youth in sectors where youth can be assured access to knowledge, technology, and markets.

Fourth, fresh produce (fruit and vegetables) and dairy are both promising and offer strong growth prospects for young farmers in Rwanda. Local demand for each is growing rapidly and export possibilities are strong. Fresh produce could be exported regionally and, if proper investments are made and sustained, internationally to high-income markets. The dairy market in East Africa is already strongly regional and growing rapidly, and Rwanda could be poised to benefit greatly from satisfying some of the growing demand among its much larger neighbors.

Fifth, FAFH stands to benefit women in Nigeria and Tanzania especially, where 90% and 71%, respectively, of all FTE employment in the sector is female.

Finally, the 25-34 year age group is significantly less likely to be engaged in farming than is the 15-24 year in each country (Table 3.19). This pattern suggests that youth may start in farming due to lack of other alternatives, but then look to leave it when they find better options. In light of this and other findings in this paper, national and regional stakeholders and The MasterCard Foundation should consider pursuing mixed strategies that (a) increase the knowledge, productivity, and market engagement of those youth who have the predilection and ability to be good farmers, and (b) provide training and other assistance to increase the profitability of off-farm activities for the many youth who will end up leaving the sector.

PART 2:
AGRIFOOD LANDSCAPE ANALYSIS

CHAPTER 4:

RWANDA LANDSCAPE ANALYSIS

Julie Howard, Andrea Allen, and Amy Jamison[1]

4.1 ECONOMIC AND POLICY CONTEXT

The East African nation of Rwanda, with a population of 11.3 million (2014), has few natural resources, is small in area (26,338 square kilometers), and is one of Africa's most densely populated countries, with 460 people per square kilometer. The population growth rate has declined in recent years, from 2.8% in 2008 to 2.4% in 2014 (World Development Indicators). Rwanda is a very young and still heavily rural country. Over half of the population is 19 years of age or under, 62% are under 25, and 69% are under age 35 (NISR 2012). Seventy-two percent of Rwandans lived in rural areas in 2014 (World Bank).

4.1.1 Labor force and employment

Of the total population, an estimated 5.9 million Rwandans are of working age, and seven in ten of these are youth.[2] Like other East African countries, Rwanda's job market is highly informal, with relatively few people engaged in formal wage employment. While the national unemployment rate of 3.4% appears low, unemployment is concentrated in urban areas. Urban unemployment is 7.7%, compared to 2.6% in rural areas (One UN Rwanda 2014).

The greater employment challenge for youth (as well as adults) is underemployment, defined as working less than 35 hours per week. Two-thirds of Rwanda's workforce is underemployed (NICR 2012) and doing work that is low in productivity/earnings or precarious in nature, which includes on-farm work. Consistent with the findings of Chapters 2 and 3, the majority of jobs created are in production agriculture, and an estimated 82% of all working adults work on their own farms. Farm workers—on their own farms or paid farm workers—are the poorest people in the work force. Forty-six percent of those working their own farms are defined as poor, and 61% of paid farm workers are poor (One UN Rwanda 2014). Most off-farm jobs created are in services, petty trade and other parts of the informal economy and are similarly low in productivity and highly vulnerable. Rwanda's main employment challenge, especially for youth, is not only the creation of jobs, but the creation of higher-quality jobs that will reduce poverty (One UN Rwanda 2014).

4.1.2 Rwanda's economic success story, and challenges in sustaining progress

Rwanda has experienced a remarkable economic rejuvenation accompanied by rapid poverty reduction since the terrible days of the 1994 genocide. The country's GDP growth averaged eight percent between 2001 and 2014. The poverty rate dropped by twenty points in the same time period, from 59% in 2001 to 39% by 2014, and inequality as measured by the Gini coefficient has declined from 0.52 to 0.49. Per capita income has grown from USD 185 to USD 620 over the past decade (NIST 2015; World Bank 2014). In addition, the country has achieved a two-thirds drop in child mortality, near-universal primary school enrollment, and significant progress on health service provision (World Bank 2014b).

Rwanda's main employment challenge, especially for youth, is not only the creation of jobs, but the creation of higher-quality jobs that will reduce poverty.

The country's focus on developing the agriculture sector, which represents about one-third of GDP and employs three-quarters of the workforce, has played a critical role in spurring economic growth that has also led to widespread poverty reduction.

1 The authors thank Regis Nisengwe for his excellent research contributions and assistance in planning field interviews.

2 Rwanda's national youth policy defines youth as individuals between 14 and 35 years of age, which corresponds with the definition incorporated in the African Youth Charter and as adopted by African Union heads of state in 2006 (African Union Commission 2012). However, the United Nations system, including the International Labor Organization (ILO), define youth as between 15 and 24 years of age.

The World Bank estimates that successful implementation of the country's agricultural sector development program, the Strategic Plan for the Transformation of Agriculture (PSTA 2), from 2008-2013 contributed over 45% of the 12 point reduction in poverty in that period (World Bank; Gaye and Turk 2014). These gains were largely due to programs focusing on sustainable land management, input provision and irrigation that increased agricultural productivity and commercialization (Gaye and Turk 2014). Rwanda's success with agriculture-led, broad-based economic growth is consistent with the Asian experience documented in the structural transformation literature, including Johnston and Mellor (1961), Johnston and Kilby (1975), and Mellor (1976) (cited in Chapter 2).

Despite the significant progress of the past decade, the agriculture sector faces critical constraints which will affect its ability to deliver inclusive economic growth or create enough jobs for the bulging youth population in the future. Rwanda's recent agriculture programs have focused on improving agricultural productivity at the farm level. However, Rwanda is severely land-constrained, with only 1.5 million hectares of arable land and an average land-holding size of 0.33 hectare, among the smallest in sub-Saharan Africa (Gaye and Turk 2014, Jayne et al. 2014).

There are four issues. First, despite recent progress, the majority of the rural population still consists of subsistence farmers, most of whom continue to use traditional, non-intensive agricultural practices (Gaye and Turk 2014). Second, consistent with findings in Chapters 2 and 3, although most jobs created to date are in production agriculture, and on-farm agriculture will continue to generate the greatest absolute numbers of jobs for at least the next decade, the employment elasticities of on-farm, traditional agriculture are low. In the future, on-farm, traditional agriculture will provide limited and lower-quality employment opportunities for the expanding youth population, a constraint that will become even more binding as land scarcity increases. Third, most of the agricultural land is held by older household heads. Interviewed stakeholders noted that it is very difficult for youth to access family land to farm for themselves, and they lack financial resources to rent farmland. This finding supports the discussion in Chapter 2 on the importance of improving youth access to land, and improving land tenure systems more generally. Fourth, older landholders were reportedly less willing to adopt new technologies, e.g., in the coffee sector, presenting an additional constraint to the agricultural intensification needed for continued economic growth and commercialization.

4.1.3 Economic policies prioritize structural change, youth and employment

Going forward, a key development challenge for Rwanda is to change the structure of economic growth to facilitate greater intensity in employment creation (One UN Rwanda 2014). Vision 2020, adopted in 2000, is the government of Rwanda's overarching economic policy. Its objective is to transform Rwanda into a middle-income country by 2020 through an increasingly knowledge-based economy that is competitive both regionally and globally (Government of Rwanda, http://edprs.rw/content/vision-2020). One of Vision 2020's key goals is for half of Rwanda's workforce to be working off-farm by 2020, up from 28.4% in 2011

(AfDB 2014). To accomplish this, the government has set a target of creating 200,000 new off-farm jobs annually, doubling the current annual job creation rate of about 104,000 jobs (One UN Rwanda 2014). The Vision 2020 goals have been implemented through a series of medium-term planning frameworks, including the Poverty Reduction Strategic Plan (PRSP I) in 2002, the Economic Development and Poverty Reduction Strategy (EDPRS) (2008-2012), and the current second Economic Development and Poverty Reduction Strategy (EDPRS 2) (2013-2018). Revised targets for Vision 2020 and EDPRS 2 aim to put Rwanda on a higher growth trajectory, and include 11.5% average annual GDP growth and the reduction of poverty below 30% (Government of Rwanda).

EDPRS 2 efforts are particularly focused on economic transformation, the private sector and improving the investment environment. About half of Rwanda's budget is allocated to the four EDPRS 2 priority areas, including a specific focus on increasing productivity and youth employment, intended to transform Rwanda from an agriculture-based economy to an industry and services-based economy by increasing the availability of appropriate skills. The other three priorities are economic transformation, which is dominated by spending in energy and roads; rural development, aimed at achieving sustainable poverty reduction through improved land use, increased agricultural productivity, and better infrastructure to connect rural communities to economic opportunities; and improving the accountability of governance (Ministry of Economic Planning and Finance 2014, 2015). Each of the priority sectors have developed specific strategies outlining how their sectors will contribute to overall EDPRS 2 goals. For example, the agriculture sector's strategy is the PSTA 2 and is discussed below.

4.1.4 Employment and skills policies seek improved coordination and outcomes

Rwanda's National Employment Policy was drafted in 2007 to provide a guiding framework for implementing policies related to employment and youth across many government ministries, including the Small and Medium Enterprises (SME) policy, the youth policy, the Technical Vocational Education and Training (TVET) policy, the education policy, the National Policy for the Promotion of Cooperatives, and the Public Works Program of the Vision 2020 Umurenge (One UN Rwanda 2014).

Coordinating Rwanda's many employment-related programs has proved to be very challenging. The National Employment Programme (NEP) (2013-18) was developed to meet the EDPRS 2 employment and productivity objectives and improve coordination. NEP has three objectives: creating jobs across the economy that are both remunerative and sustainable; improving the skills and attitude of the workforce to increase productivity; and providing a national framework for coordinating employment-related initiatives. The framework has four pillars: Skills Development, led by the Ministry of Education (MINEDUC); Entrepreneurship and Business Development, led by the Ministry of Trade and Industry (MINICOM); Labor Market Intervention, led by the Ministry of Public Service and Labor (MIFOTRA); and Coordination, Monitoring and Evaluation, also led by MIFOTRA (One UN Rwanda 2014). The NEP brings at least 19 overlapping programs into an integrated framework intended to yield better results, including Kuremera, Hanga Umuriumo, Agaciro, Kanjye, and Youth Empowerment for Global Opportunities (YEGO) (Ministry of Economic Planning and Finance 2014).

As part of NEP, MIFOTRA and the National Capacity-Building Secretariat (NCBS) have developed a five-year program for skills development to address critical skills needs in high priority sectors designated by EDPRS 2, particularly at the technician and professional levels. These sectors are infrastructure, agriculture, natural resources, investment, trade and industry, ICT, health, and education (MIFOTRA and NCBS 2013). Specific skills gaps identified for the agriculture sector are discussed in section 4.3.5.

4.2 RWANDA'S AGRIFOOD SECTOR

Although the share of agriculture in Rwanda's economy declined from 45% to 34% of GDP between 2001 and 2011, the agriculture sector remains the source of employment and income generation for the majority of households, and is a key driver of growth and poverty reduction nationally. Agricultural GDP grew at 5.2% per year between 1999 and 2012, accelerating to 5.7% per year between 2006 and 2012 (World Bank 2014b). Following increased investments in agricultural inputs, land consolidation and erosion control, and irrigation and other rural infrastructure, household-level agricultural production more than doubled between 2001 and 2011 (World Bank 2014b). Rwanda's agricultural production provides 90% of its food needs, consistent with Chapter 3 findings on the importance of Rwanda's own production in

meeting household and market requirements. As a result of increased productivity, rural households were able to sell an increasing share of their harvests in local markets, and the expansion in production accounted for one-third of the growth in rural consumption from 2001 to 2011 (Gaye and Turk 2014; World Bank 2014b).

4.2.1 Guiding agricultural policies and frameworks

Rwanda's agricultural progress, and the role it has played in significant poverty reduction, is in large part attributable to favorable agricultural policies. These policies have provided a positive framework for sector programs that have driven overall GDP as well as agriculture sector growth. Rwanda's agricultural programs have also benefitted from tightly coordinated support by the donor community.

The policy environment includes Rwanda's Vision 2020, the Poverty Reduction Strategy Paper, EDPRS 1 and 2, and, in the agriculture sector, the National Agricultural Policy, Strategic Plan for the Transformation of Agriculture Program 1 and 2 (PSTA 1, 2), and the Comprehensive Africa Agriculture Development Programme 1 and 2 (CAADP 1, 2). (World Bank 2014b). Under PSTA 3 (2013-18), the target for agricultural growth is 8.5% per year.

4.2.2 Key agencies and organizations

The main public and private sector agencies relating to the agrifood system include:

- **Ministry of Agriculture and Animal Resources (MINAGRI):** the lead government ministry for the agriculture sector, composed of four departments: planning, inspection, crop production and animal resources
- **Rwanda Agriculture Board (RAB):** semi-autonomous agency of MINAGRI responsible for promoting food products. RAB has a national network of research stations, projects, and staff focusing on improving food staple production and registration, certification of seeds
- **National Ag Export Board (NAEB):** semi-autonomous agency of MINAGRI, responsible for export crop production including coffee and tea, and more recently horticulture and non-traditional export crops
- **Rwanda Development Board (RDB):** responsible for investment, promotion, and foreign direct investment
- **Ministry of Trade and Industry (MINICOM):** responsible for promoting business, trade growth and development, including agribusiness
- **Development Bank of Rwanda (BRD):** holds an agriculture and agribusiness loan portfolio worth RSF 33.3 billion (2014). The majority of agriculture loans are for coffee, tea, and fertilizer; and,
- **Private Sector Foundation (PSF):** an umbrella body for the private sector, responsible for advocacy/dialogue with the government and carrying out training programs on entrepreneurship.

4.2.3 High potential agricultural value chains

Analysis by the World Bank indicates that several agricultural value chains show potential for intensification, value addition, and employment creation. Interviewed stakeholders and the analysis in Chapter 3 generally affirm these priorities.

- **Livestock.** Two-thirds of rural households hold livestock, a percentage that has been declining since 2005 because of growing population and difficulties in finding pasture, forage, and feed. Despite the smaller proportion of households holding livestock, in recent years more animals have been marketed and more inputs were purchased for them. This indicates the sector is shifting to greater intensity and productivity. With increasing household incomes, there is considerable potential for expanding the production of small ruminants, pigs, poultry and related processing (World Bank 2014b).
- **Coffee.** Fully washed Arabica coffee gets a premium price on world markets. From 2008–2012, fully-washed coffee increased from 10% to 29%, and is set to expand further as older washing stations are being replaced by smaller, more profitable ones. Interviewed stakeholders indicated that coffee productivity is lower than potential, due in part to fluctuating world prices which affect farmer incentives to maintain trees, and the aging coffee farmer population, which is less inclined to adopt new technologies, replant and improve their managements skills (World Bank 2014b; Clay 2016, personal communication).
- **Green leaf tea exports.** The Rwandan tea industry is undergoing reorganization, with greater attention to outgrower relationships to improve quality and marketing. Key informants expect demand and tea exports to grow rapidly in the future, especially for high-quality teas. (World Bank 2014b).

- **Pyrethrum exports.** The outlook for expansion of pyrethrum (a natural insecticide) exports appears good, and an existing extraction plant is currently operating at only one-half capacity (World Bank 2014b).
- **Horticultural exports.** Rwanda's climate and soils are ideal for horticultural crops, which can be grown intensively in rotation on a very small land area in both rural and peri-urban areas. Expansion of the horticulture industry is a high priority of the government and has received support from donor partners. Interviewed stakeholders described the emergence of an integrated supply chain approach focused on production and processing, transportation and direct marketing through dedicated contracting arrangements with buyers based in the region and internationally (Clay et al. 2015; World Bank 2014b).
- **Milk production.** Production of raw, unpasteurized milk expanded rapidly during PSTA 2. However, local processors were unable to compete with lower cost regional neighbors and Rwanda's milk processing plants operated at less than one-fifth of capacity. In the future, increasing demand for dairy products in urban areas is expected to lead to the development of a more efficient Rwandan milk processing industry (World Bank 2014b).
- **Fisheries.** If management is improved, it will be possible for the sector to overcome current overfishing issues, arrive at a more sustainable growth path and produce high-value nutritionally rich fish for domestic and regional markets (World Bank 2014b).

An analysis of different food and export crops, animal products and processed products shows that Rwanda has the strongest comparative advantage in Irish potatoes, cassava, dried beans, bananas, horticultural products, tea and coffee. Among horticultural crops, comparative advantage has been confirmed for avocados, pineapples, and passion fruit, but only a few crops were analyzed and comparative advantage likely exists for a wider range of fruit, vegetables and flowers because of Rwanda's favorable climate and soil conditions (World Bank 2014b). Key constraints to the development of these sectors include lack of improved seed and planting materials, mismatch of current varieties with processing and taste characteristics, pests and diseases, lack of modern processing technology, and high rates of post-harvest loss. Other barriers include fragile soils and high transport costs to export markets (DAI 2014, World Bank 2014b).

In addition, domestic consumption of processed agricultural commodities and the demand for processed beverage, horticulture and other products, and related opportunities for expanding employment, are expected to grow, as discussed in Chapter 3. However, the current share of processed products in total agricultural and livestock domestic production, exports, and, as confirmed in Chapter 3, domestic consumption, is small. Stakeholders interviewed noted that government will need to support policy and program priorities to accelerate private sector expansion and processing in the value chains discussed above (World Bank 2014b). These strategies and programs include improving technical and skills training, discussed below, as well as targeted agricultural research, access to finance and land, improvements in transportation and storage, grades and standards, and improving the efficiency of customs clearance processes (World Bank 2014b; Clay et al. 2015). Additional, value chain-specific research will be required to understand how jobs are created through value chain linkages and demand, how specific opportunities may respond to growth in overall income, and to changes in domestic and export demand, and to determine policies needed to facilitate the cost-effective growth of off-farm agrifood system employment (World Bank 2014b).

4.2.4 Challenges for SME development and current programs to address them

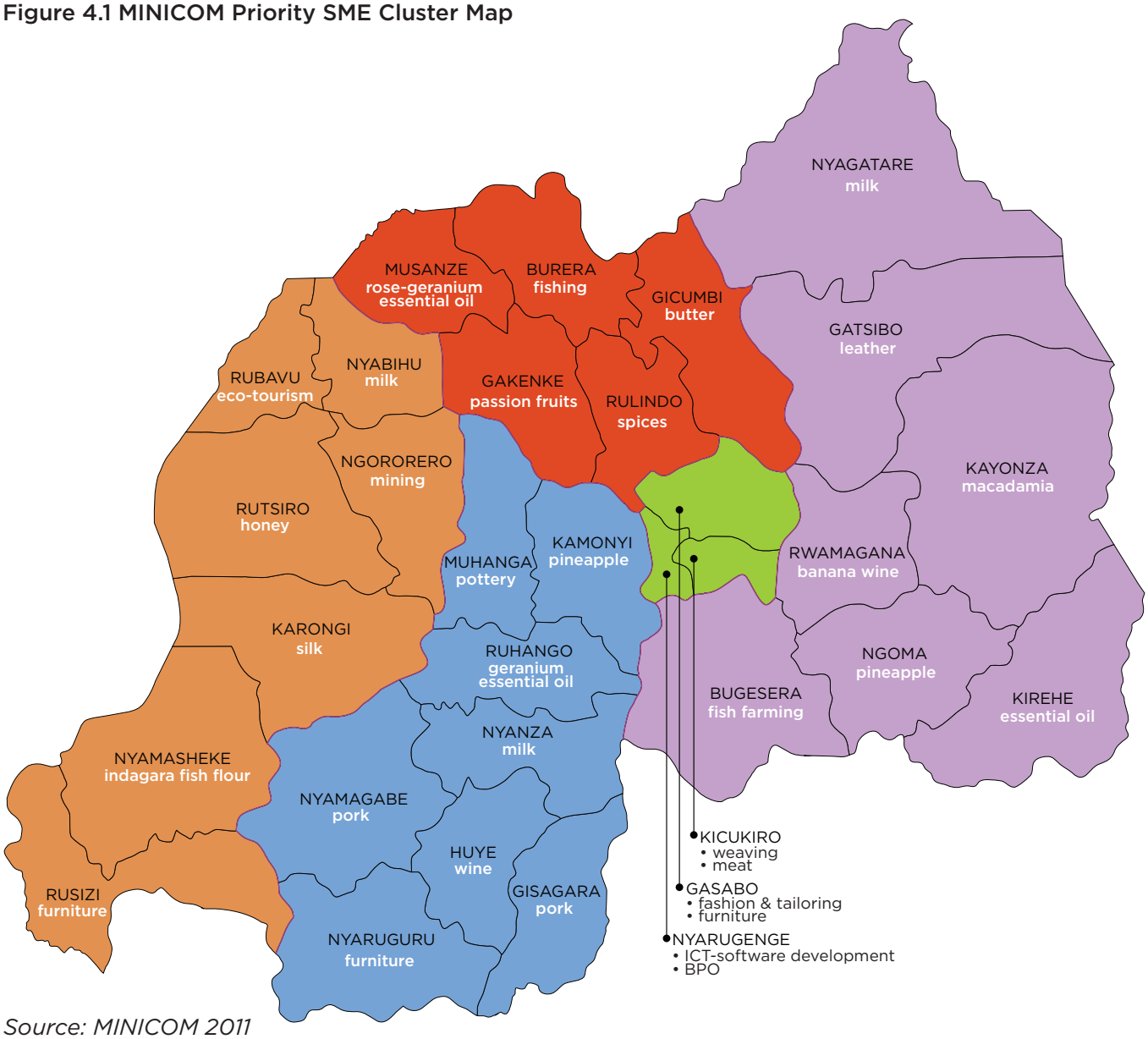
Small and medium enterprises (SME) include both formal and informal businesses, make up 98% of all businesses in Rwanda, and provide 41% of all private sector employment (MINICOM 2011). SMEs are a critical lever for the development of agricultural value chains, and employment opportunities for youth, in line with Rwanda's comparative and competitive advantage. Two major programs of the Ministry of Trade and Industry (MINICOM) to accelerate SME development are discussed below.

MINICOM introduced the Hanga Umurimo Program (HUP) in 2011 to stimulate SME development for the creation of off-farm jobs. HUP, a part of MINICOM's sector plan under EDPRS 2, assists young Rwandans, through technical support and financial guarantees, to develop bankable business ideas for competitive and innovative enterprise creation in priority areas including retail and distribution, agriculture, manufacturing/processing, service/transport, tailoring, carpentry, handicrafts and livestock. The

Business Development Fund (BDF) is a core partner in HUP, and provides 75% guarantee funds for approved HUP projects that are financed by commercial banks and microfinance institutions, including Savings and Credit Cooperatives (SACCOs) (MINICOM 2014). MINICOM and interviewed stakeholders noted the challenges faced by HUP, including the reluctance of financial institutions to fund projects, especially new business ideas, despite loan guarantees; SME lack of collateral; poor business management skills; delays by BDF in approving projects; and the lack of market for some of the SME products (MINICOM 2014).

To address the low approval rate for bank loan applications, BDF has increased support for training on how to write a business plan. Interviewed stakeholders noted that this has resulted in a higher rate of loan approvals, but young entrepreneurs continue to face difficulties in starting up and running successful businesses, and the loan failure rate remains high. In 2015, non-performing loans represented nine percent of BDF's overall portfolio, a total of 229 assets/projects valued at 3.7 billion Rwandan francs (Agutamba 2015). Between 2011 and 2014, 145 SME projects were listed in BDF's non-performing loan portfolio, including 51 from HUP (Agutamba 2014). Beyond support for business plan development, young entrepreneurs require ongoing mentorship from experienced private businesses and resources to help them solve problems as they arise. BDF and its partners are working to make continuing technical support from experienced private sector professionals more readily available to young entrepreneurs, but it has been challenging.

Figure 4.1 MINICOM Priority SME Cluster Map



Source: MINICOM 2011

A second program was developed by MINICOM beginning in 2011 to identify competitive SME sectors per district and prioritize and provide targeted support to allow SMEs to develop businesses within the most viable sectors in different areas of the country. Most of the potential clusters identified (Figure 4.1) focus on value addition to agricultural products (MINICOM 2011, MINICOM 2015). The program's focus on clusters is based on work by the economist Michael Porter regarding the benefits of clustering or geographic concentrations of interconnected companies and institutions in a particular field. Potential benefits of clusters include improved access to raw materials, customized business development services, access to skilled labor, and competition among enterprises to increase innovation and efficiency, and infrastructure development to facilitate trade (Porter 1990).

A key component of the SME Plan is the development of Community Processing Centers (CPCs). The CPCs provide shared facilities and access to specialized training to help producers at the community level make and market quality products without having to bear the total cost of the machinery and technology to process the products (MINICOM 2015). As of March 2016, the Leather CPC in Gatsibo, the Dairy CPC at Burera, and the Irish Potato CPC were operational.

As an example of the CPC approach, the Irish Potato CPC is a medium-sized potato processing factory with training and incubation facilities. It has the capacity to produce potato chips and crisps, whole peeled potatoes, and whole cleaned potatoes for sale to supermarkets and schools. The CPC was constructed by MINICOM and the National Industrial Research and Development Agency, in partnership with the Business Development Fund, the Nyabihu farmer's cooperative and the European Union. Twenty-one staff members have been trained on modern technology in potato processing, good manufacturing practices, product development and marketing (MINICOM 2016). The next group of CPCs planned include a banana wine CPC in Rwamagana and additional CPCs in tailoring/fashion, ceramics/pottery, minerals/precious stones, and honey.

SME cluster platforms have also been established in maize, cassava, horticulture, ceramics/pottery, meat, leather, textiles/garments, dairy, honey, wood/construction material, and ICT to allow stakeholders to share challenges and promote cluster competitiveness in local and international markets (MINICOM 2015, 2016).

4.3 SUPPLY OF WORKERS

4.3.1 Structure of the education sector

Rwanda's educational system is overseen by the Ministry of Education (MINEDUC), which is responsible for policy formulation and setting norms and standards for the education sector. The system consists of four main levels: pre-primary, primary, secondary and higher education. There is also a significant and robust TVET stream at both secondary and higher education levels. MINEDUC also oversees non-formal education or Adult Basic Education (ABE). By 2012, Rwanda had achieved a primary school completion rate of 72.7%. The completion rate for girls is higher than the national average, reaching 77.7% (MINEDUC 2013). The transition rate to secondary school is 78% (FHI 360 2014). Improving the TVET system is a high priority for the government since it is seen as critical to solving the skills gap that currently exists among Rwandan youth. Overall enrollment in TVET programs has increased significantly in the last three years.

MINEDUC's new curriculum framework for pre-primary to secondary education, published in 2015, addresses the need to balance academic goals with obtaining skills for the world of work (MINEDUC 2015). One of the cross-cutting themes for all educational levels is "environment and sustainability" which addresses both agriculture and entrepreneurship issues. More generally, MINEDUC policy documents recognize the importance of increasing access to agricultural skills training at all levels of primary and secondary school. The TVET system provides agricultural skills training utilizing a more experiential, applied approach at secondary and tertiary levels. Finally, at the higher education level, students can access agrifood-related training at Integrated Polytechnic Regional Centres (advanced diplomas) and the University of Rwanda.

Table 4.1 Population of 14-35 years of age by level of education attained.

		Education level attained					
		Never been to school	Did not complete primary	Completed primary	Completed post-primary, secondary, or higher	Not declared	Pop. aged 14-35 (000s)
	Rwanda	**7.5**	**54.7**	**31.5**	**4.9**	**1.4**	**4159**
Urban/ Rural	Urban	4.7	37.2	41.6	14.5	2	710
	Rural	8.1	58.3	29.5	2.9	1.3	3,449
Province	Kigali City	4.1	34.2	42.7	16.7	2.2	496
	Southern	7.4	57.1	30.8	3.1	1.6	920
	Western	8.8	57.8	28.7	3.7	1	993
	Northern	6.9	56.1	32.3	3.4	1.3	769
	Eastern	8.6	58.4	28.8	2.8	1.4	980
Age (in years)	14–19	2.4	64.3	32	0.1	1.3	1,491
	20–24	6.6	49.7	34.5	5.8	3.3	1,026
	25–29	11.5	54.1	24.1	9.6	0.7	885
	30–35	14.1	43.1	35.3	7.4	0.1	757
Sex	Male	6.4	55.5	31.2	5.5	1.5	1,971
	Female	8.5	53.9	31.9	4.3	1.4	2,188
Quintile	Q1	11.7	68.7	18.4	0.3	1	676
	Q2	9.6	64.4	24.5	0.6	0.8	728
	Q3	7.7	60.9	29.2	1	1.2	793
	Q4	6.5	53.9	35.7	2.2	1.7	874
	Q5	4.2	35.5	42.7	15.5	2.1	1,088

Source: NISR 2012 Youth

4.3.2 Education stocks and flows

Among all Rwandan youth aged 14-24, recent census data indicate that 61% attended school only at primary school level, 22% continued to secondary education, three percent went to university, and 12% have no formal education. Primary school is the highest level of education attained by most young people, with a higher proportion of rural youth (65%) than urban youth (44%) completing primary school (NISR 2014). The majority of young people (77%) can read and write in Kinyarwanda. English has now overtaken French as the second language of literacy, and 21% of youth can read and write in English, compared to 13% for French (NISR 2014).

Educational attainment varies significantly between those defined as youth (ages 14-34) and those in later age ranges, as described in the NISR 2012 Thematic Report on Youth, summarized in Table 4.1.

4.3.3 Education and employment

Sixty-three percent of youth are in the labor force, as either full- or part-time workers or self-employed. Starting from 27% in the 14–19 age group, labor force participation increases to 67% by 20–24. At 30–35, almost nine in ten people are in the labor force. Youth unemployment is generally low at 4% overall, and is inversely related to education level. Those without formal education or only primary level education have relatively low unemployment rates (3%), but with increasing education levels, young people face difficulties finding employment. The highest unemployment rates are observed among young university-educated women (17%) (NISR 2012). The NISR finding aligns with growing evidence for increasing levels of unemployment among higher education graduates in Africa (Aryeetey et al., 2015; Filmer and Fox 2014), but differs from Chapter 2's specific observation that education levels were unrelated to unemployment in Rwanda, possibly due to the different datasets used.

Underemployment is the real issue for the youth of Rwanda, where some 65% can be considered

underemployed (NISR 2012b).[3] The majority of these youth can be found working in agricultural jobs as unpaid family workers, self-employed farmers, or wage workers (NISR 2012b; IDRC 2015), often holding multiple jobs and earning subsistence wages only.

Figure 4.2 shows the top occupations among Rwandan youth are skilled agricultural, forestry, and fishery workers (67%), service and sales workers (12%), crafts and related trades workers (6%) and technicians and associate professionals (6%). More young women than men are working in agricultural, forestry and fishery occupations (NISR 2014). Gender differences are further examined in section 4.4.

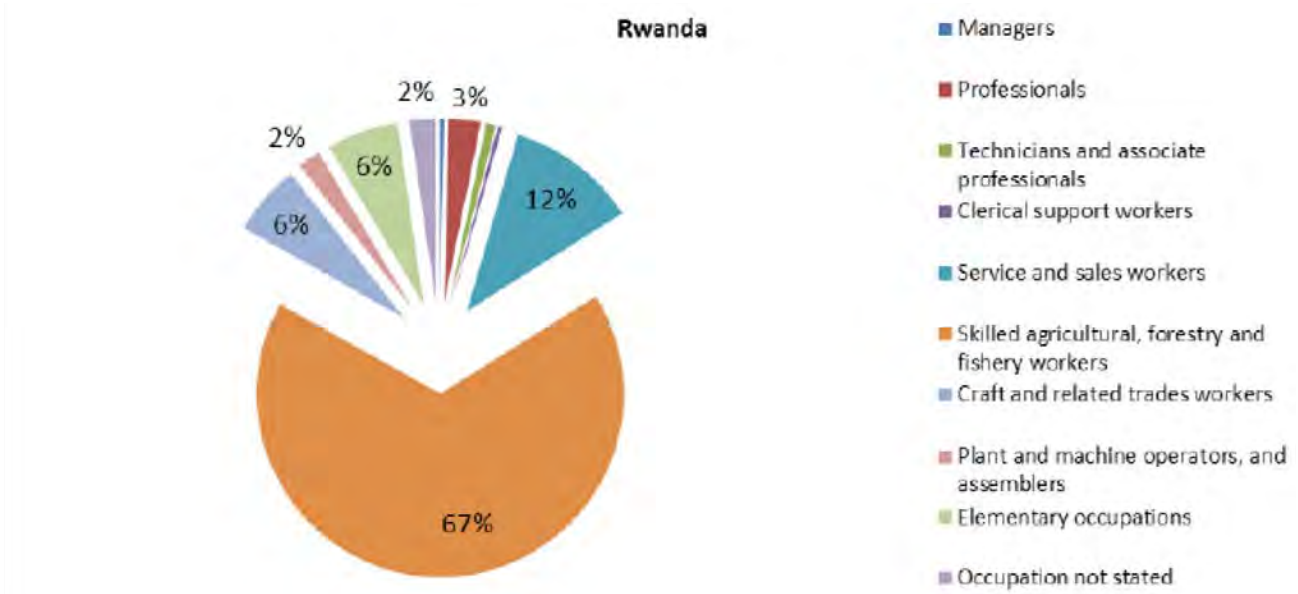
4.3.4 Skills needed by employers and entrepreneurs

Global research on skills sought by employers and needed by entrepreneurs points to skill needs in three areas (illustrated in Figure 4.3 below) including: foundational (literacy, numeracy); technical (e.g., food safety, processing, packaging, food service, marketing); and work readiness-related or "soft skills" (WC 2014). Computer and financial literacy can be considered cross-cutting or even foundational for the next generation workforce. Soft skills are especially important for entrepreneurial effectiveness, e.g., persistence, self-discipline, and adaptability (WC 2014). Increasing consensus is emerging about what constitutes the essential soft skills. A recent study synthesizing related global research identified five critical skills linked to successful outcomes. These are social skills, communication, and higher-order thinking skills (including problem solving, critical thinking, and decision-making); supported by the interpersonal skills of self-control and positive self-concept (Lippman et al. 2015).

Linking the evolving demands of the country's economic system to a qualified local workforce requires that workforce to demonstrate a combination of such key foundational, technical, and workforce readiness skills. Private sector employers in Rwanda report that current university (especially) and vocational training programs are not providing graduates with necessary skills and experience to enable them to succeed on the job without significant additional training. Employers have identified the need for key technical skills including basic accounting; planning, organization and decision making; marketing and business skills; and ICT skills to address hardware, software, internet navigation, programming, etc. Soft skills needed include teamwork, moral values, language and communication skills, integrity, loyalty, and presentation skills (IYF 2011).

3 Underemployment, as defined by the National Institute for Statistics Rwanda, falls at 35 hours/week or below (2012b).

Figure 4.2 Top occupations among Rwandan Youth



Source: Fourth Rwanda Population and Housing Census. Notes: (1) Base population: currently employed youth aged 14 to 35.

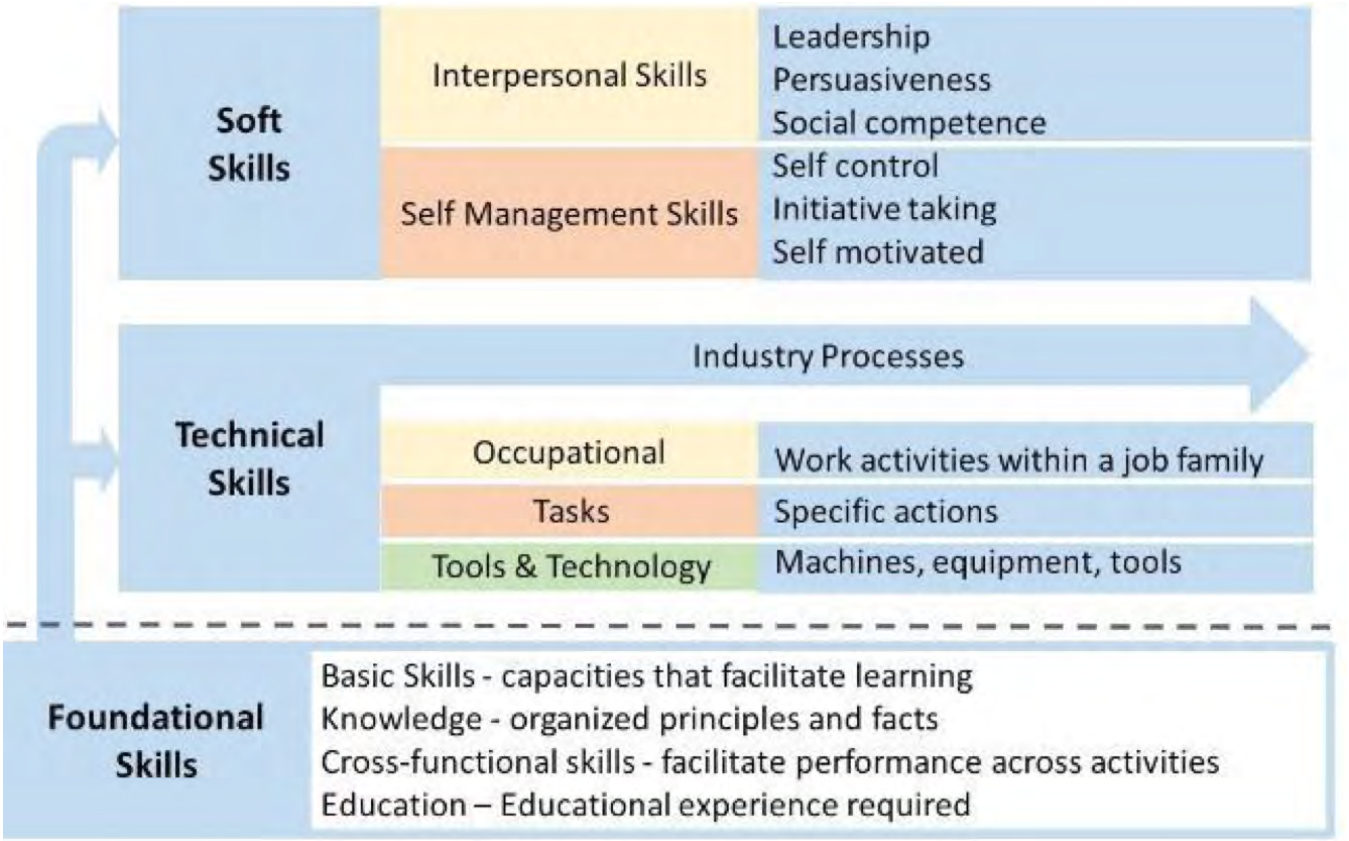
Employers surveyed by the International Youth Foundation (IYF) for the "Rwanda Labor Market and Youth Survey" (2011) linked youth employment issues to inadequate social networks and lack of helpful work-related contacts, as well as skill gaps. Every employer interviewed by IYF highlighted the need for young people to improve soft skills, although, conversely, the young people surveyed seemed confident about their soft skills (IYF 2011). Youth expressed greater interest in learning key entrepreneurial and vocational skills, as well as the ICT and business skills noted above (IYF 2011).

4.3.5 Capacity building in the TVET system

Capacity building is discussed first as an ongoing approach to developing the country's workforce. Capacity building programs distinguish between youth with primary education, those with secondary school, technical vocational education and training (TVET), and beyond. The term TVET is used in various ways, often referring to the formal system of increasingly integrated polytechnic regional centers (IPRC's) located in four provinces and Kigali city (North, South, East, West, and Kigali), and each offering training and qualifications on par with a university diploma. Each IPRC in turn has the responsibility to supervise all Technical Secondary Schools (TSS) and Vocational Training Centers (VTC) located in their corresponding province/city. The term TVET is also used in reference to VTC, TSS or sometimes only to the polytechnic or public sector education that is post-secondary but pre-university. Most polytechnics are now private, however, so VTC level training, including for the agriculture sector, is most often provided by nonprofit and private sector organizations.

The Workforce Development Authority within the MINEDUC must approve all TVET curricula and plays an essential role in determining the shape of TVET capacity building for youth via both public and private entities. Recent reforms in line with Vision 2020 and EDPRS 2 seek to coordinate public and private TVET training across the country, in order to create a higher quality, competence-based curriculum that is responsive to market needs and incorporates more opportunities for students to attain hands-on practical experience. The reforms also seek to strengthen the culture of self-employment, support job creation, promote gender equality and empowerment of women in rural areas, and improve the institutional capacity and financial sustainability of the TVET system.

Figure 4.3 Workplace connections skills framework



Source: Workforce Connections 2014

On the latter point, the formal TVET system is challenged in its ability to include equitable numbers of women and rural students (IDRC 2015; ILO 2010; FAWE 2010). For example, the LMIS database lists the number of TVET students in 2010 as 8,951 males and 5,895 females (MIFOTRA/LMS 2016). Since rural women hold the majority of agricultural jobs, many of them on-farm and subsistence in nature, failure to include this population effectively in the TVET system overlooks a significant opportunity to increase productivity in a critical sector of the economy. Although employment creation in the agricultural sector as more traditionally defined (i.e., on-farm and stopping at the farm gate) is relatively inelastic, improving the productivity of on-farm jobs will increase incomes and the quality of life for those involved, particularly rural women.

4.3.6 Addressing the agriculture sector skills gap

The perception of agriculture as a last-resort, low-profit option, with difficult access to land, financial resources, lack of technology and infrastructure combine to push youth away from agriculture, as the lure of modern urban life exercises its pull to youth in Rwanda and across the globe. However, modern skills, emerging technologies and innovations in the agrifood system—both on- and off-farm—hold the potential to increase agriculture's profitability and attractiveness to youth (Betcherman and Khan 2015).

Currently, very few formal TVET programs focus on agriculture or value-chain related training. A 2012 survey of agriculture sector skills requirements by the Rwandan Development Board (RDB) identified a fundamental mismatch in the supply and demand for skills in the agriculture sector, noting the country is producing managers and professionals, when the market requires technicians and trained artisans (RDB 2012). A frequent complaint of private sector stakeholders interviewed by the AgYees team was that university and TVET program graduates lack substantial field experience and the training provided is out-of-date. Stakeholders cited the need for increased attention to emerging production technologies including water harvesting, mechanization, aquaponics, as well as storage/waste reduction, and marketing, consistent with Chapter 2 findings on the importance of specific training for youth to improve agricultural productivity on-farm. Stakeholders interviewed cited a growing demand for skills in off-farm segments of agricultural value chains, including food processing and packaging to meet changing domestic and export market demands, reinforcing Chapter 3 conclusions about emerging opportunities in the off-farm portion of the agrifood sector. In addition, supermarket, hotel and restaurant representatives interviewed cited the need for expanded local capacity in food service and culinary arts.

Many of the recommendations proposed by the Rwandan Development Board aim to directly engage the private sector in identifying skills needs on a continuing basis, and providing more opportunities for students to gain practical experience (RDB 2012). They include establishing Sector Skills Councils, a Sector Skills Fund, a national internship policy (to include industrial levies to help fund internship programs, and/or tax rebates for providing internship opportunities), and mentorship programs for agribusiness (RDB 2012). EDPRS 2 also notes the need to strengthen partnerships between TVET providers and employers, emphasize practical/experiential learning, and promote entrepreneurship and industry connections to assist students to integrate rapidly into the workforce and generate income.

In addition, RDB recommended that new training programs be established in a number of areas. These include Agriculture Education & Extension; Horticulture; Food Safety and Security; Irrigation & Water Engineering; Plant Pathology; Agricultural and Dryland Resource Management; a number of specialty areas related to animals and animal products, including Veterinary Medicine, Veterinary Parasitology, Clinical Pathology and Laboratory Diagnostics, Animal Genetics and Breeding, Animal Nutrition and Feed Sciences, Leather Science and Technology, Poultry Science, and Fisheries and Aquaculture Management; Leather Science & Technology; and business, information and marketing areas including Agricultural Information, Technology and Management, Marketing and Business Management, and Agro-processing and packaging.

4.3.7 Engaging the private sector to expand practical experience

Work-study and apprenticeship programs that place students directly into companies to receive on-the-job training are widely recognized as a critical and effective means to accelerate skills development. But with Rwanda's relatively small and weak private sector, it has proved difficult to make good quality opportunities available. GIZ/Rwanda has been a

particular leader in this area, focusing primarily on construction-related trades. Its work with the PSF and local governments has significantly expanded private sector participation in training design, and improved the quality of internships by screening and providing advance training to students and companies as well as follow-up assessments. A formal apprenticeship program for the plumbing trade is planned.

In the agrifood system, Rwandan training organizations are beginning to work with the private sector to help with curriculum revision and internships, apprenticeships, and additional training. Individual coffee companies have also offered occasional "coffee colleges" to engage young people in the districts where they operate.

Recently, agriculture-related TVET training has benefitted from technical support provided through the Belgian Common TVET Support Programme (PAFP) to integrate the private sector and other stakeholders more systematically into the process of curriculum design, testing and program implementation. PAFP collaborated with multiple stakeholders—in WDA, IPRCs, private sector firms, and trainees—to develop and pilot a competency-based curriculum for five agrifood related trades, featuring three levels of certification within each trade. The focus trades are animal health, crop production, forestry, food processing, and agricultural mechanization. Feedback from trainees and employers has been very positive. Once the curriculum is officially in place across the TVET system, it will be important to build in adequate practical experience for students, create a platform for TVET sub-clusters to share results and feed them back to improve future program design, and improve the process for standardizing accreditation and validation of programs implemented by different partners (PAFP 2015).

Most implementing organizations demonstrated strong awareness of a range of best practices for education for employment programs, employing three or more (sometimes all) in their curricula and programmatic approaches. Best practices include competency based training (CBT); entrepreneurship/business skill development; soft skills cultivation, often including leadership training; use of peer support and/or mentors; collaboration with private sector firms; and ICT skill development. Technical areas addressed include agriculture and animal husbandry, processing, marketing/business development, hospitality (hotels and restaurants). Entrepreneurship activities in rural areas often involved a food-related activity, regardless of whether training received had a specific agrifood focus. Business ventures mentioned included local processing (e.g., juices and cooked foods), transport (often by bus), marketing (as cooperative), and restaurant ownership. Also among best practices observed were the use of networks, cooperatives-federations, coalitions and associations as a way to scale and increase sustainability by working in partnerships. These partnerships are composed of producers and processors, and are often in collaboration with international and multiple local nonprofits, CSOs, district government, with contacts in a relevant GOR agency. Examples of this approach are discussed in section 4.5.

Also noteworthy are the precise targeting efforts of USAID- and The MasterCard Foundation–funded youth economic opportunity activities in Rwanda. For one example of precise targeting, see the scale and sustainability study of Akazi Kanoze, which describes multiple subpopulations among their target groups and considers tailored approaches for each (Kohl and French 2014, USAID 2014).

4.3.8 Challenges remain

In their recent and broader scoping study of youth employment in Rwanda, IDRC recommended additional research to better understand core challenges and appropriate program responses with regard to worker supply (2015). Priorities include research on the nature of underemployment; factors

driving the growth of informal sector businesses; gender disparities in employment outcomes; how to improve rigorous impact evaluation of training programs; understanding youth aspirations and challenges; and factors affecting cross-border labor mobility.

Challenges also remain in identifying and reaching out-of-school rural youth via certificate/nonformal level training (limited in scope via formal tertiary systems, most with prerequisites), including: 1) the need to develop key short courses adapted for less literate populations and relevant to Rwanda-based agrifood activities; and 2) stackable, officially recognized credentialing. Advances made via informal training of youth (distinct from nonformal) via NGOs have not yet been fully integrated into the informal TVET system, nor does it appear that MINAGRI has been sufficiently engaged in this effort.

Promising approaches for scaling-up best practices—including competency based curricula, private sector collaboration, local stakeholder partnerships, and mentorships—have been elaborated by USAID, the Belgian Development Cooperation, and others. A USAID-sponsored "Scale and Sustainability Study" examined this issue with regard to their "Akazi Kanoze Youth Education and Livelihoods Project," implemented by an EDC-led consortium of local and international organizations (USAID 2014). The analysis considers five scaling-up options for Akazi Kanoze (AK), including through the TVET system via WDA, in urban areas, in rural areas, via existing civil society institutions, and through other government programs, with the possibility of blending those approaches based on specific GOR and donor priorities. These findings are potentially applicable to other youth employment activities with similar project characteristics, including those within the agrifood system, as AK employment and enterprise development activities with youth span large off farm segments of multiple value chains.

More recently, The Belgian Development Cooperation, with the PAFP and MINEDUC, sponsored a symposium on TVET in Kigali. The symposium included participants from across Africa and the world, and sought to: "(1) share experiences from the field and from different countries, (2) to exchange on these experiences and draw lessons learned and (3) to give feedback in the form of best practices and recommendations to decision makers in TVET from various countries" (MINEDUC et al. 2015). Lessons and best practices from PAFP informed recommendations for scaling up competency based curricula, decentralization, financing and market relevance, workplace learning, and training of trainers. A significant portion of material covered focusing on agricultural TVET specifically (MINEDUC et al. 2015).

SNV scale-up efforts have involved expanding activities with more than 20 new civil society organizations, and collaborating with for profit consulting agencies, district-level government, and with union of cooperatives in districts where they work.

Additional areas where promising approaches have emerged include those focused on gender issues in youth employment and the formation of networks involving multiple types of stakeholders, as discussed further in sections 4.4 and 4.5.

4.4 GENDER CONTEXT

This section examines the situation of young women and men in the agrifood system by reviewing available data, identifying data gaps, and making a preliminary assessment about relative empowerment in that system. The section also considers what other recent assessments have concluded concerning key gender-based constraints, and summarizes remaining challenges and recommendations on how to proceed.

4.4.1 Overview of relevant data availability and gaps

NISR provides excellent thematic assessments of census data. Topics of relevance to youth in the agrifood system include those on gender, youth, agriculture, and economic activity. These resources are easily accessed via the NISR website, along with general census data reports and anonymized raw microdata sets from the census and other survey efforts. Although women and youth constitute the rural majority in both countries, few existing analyses examine factors affecting the development of specific value chains using youth and gender lenses. Census data and other household and business establishment data could be used in similar ways as the Women's Empowerment in Agriculture Index and other studies to track the development of specific priority value chains and their contribution to agricultural, economic, and workforce development goals, and determine what program interventions are most effective in improving the participation and success rate of these target groups.

Because such a large portion of the country's population is rural and employed in agriculture, some key aggregated statistics are worth considering. For example:

- According to the most recent census information available, 111 women are employed in agriculture for every 100 men, though younger cohort women only slightly outnumber men in their cohort (NISR 2012).
- Educational attainment varies significantly between youth and those in later age ranges, as described in the NISR 2012 Thematic Report on Youth, and summarized in Table 4.1.
- Both young men and young women demonstrate comparable completion rates for both "primary school" and "post-primary, secondary or higher" (NISR 2014). This balance disappears the more advanced the credential. For example, the LMIS database lists the number of TVET students in 2010 as 8951 men and 5895 women (MIFOTRA/LMS 2016).

While data such as these are important to consider, such analyses stop short of the type of multivariate consideration necessary to appreciate rural/urban, region and district level variations. Areas where some of the key co-relations relevant to the agrifood system can be examined include those related to:

- Household headship: 66.5% men, 27.7% women (though de facto 34%), and women headed households are most dependent on farm jobs (NISR 2014);
- Main job by sex and age: 49.4% men and 71.9% women report their main job as independent, small scale farmer, with young women demonstrably more involved as "small-scale farmer" compared to young men (NISR 2014).

Examples of robust multivariate data analyses include: 1) those carried out by IFPRI and others as a baseline study of the Women's Empowerment in Agriculture Index (WEAI) for USAID Feed the Future initiatives, including those in Rwanda (see IFPRI 2014); and the Rwanda Demographic and Health Survey (RDHS; per NISR 2012 on Gender). Key results of these studies are addressed briefly in the following section on "gender perspective in the agrifood system." It is worth noting that project-specific studies, carried out by individual project implementers, often include relevant multivariate analyses as well, but are generally less available to the public. Careful examination of the forward and backward linkages among youth economic activities associated with specific commodities has largely gone unrealized, and with it related consideration of pathways to employment for rural youth from subsistence production to enterprises and service sector.

Finally, attention to the gender-based constraints for men is missing, particularly with respect to the agrifood system. While men's roles and identities are taken into account in addressing reproductive health, HIV, and gender-based violence, little attention has been given to men's roles with regard to individual empowerment—of both women and men—in the agrifood system. Of particular interest would be Rwandan concepts of masculinity, and how these both affect women's participation in the sector, and could potentially shed light on ways to more effectively engage both young men and young women in agrifood development activities. A recent exception in this respect is Sommers' 2012 exploration of masculinity and adulthood for rural Rwandan youth. Until young men marry and build a house, they are not considered fully adult in the Rwandan cultural context. These men, along with the women they would potentially marry, are thus trapped in a condition of "waithood". At the same time, national housing and land policy currently contributes to this dilemma via strict building requirements, prohibitive pricing of materials, and a general land shortage that is exacerbated for rural youth.

4.4.2 Gender perspective on Rwandan youth in the agrifood system

Data from the WEAI baseline study in Rwanda examine: 1) five domains of empowerment, including decisions about agricultural production, access to and decision making power over productive resources, control over use of income, leadership in the community, and time allocation; and 2) a gender parity index, measuring women's empowerment relative to men's in the same household (IFPRI 2014). Results for Rwanda indicate relatively high levels of empowerment and relatively equitable gender parity measures. Nevertheless, clear constraints included workload and access to credit for both women and men. Control over use of income was a large factor for women, while group membership for men was more critical. Overall, "time allocation and community leadership account for over 50% of women's disempowerment" (IFPRI 2014).

Going beyond the statistics to examine the country's recent history, as a result of genocide many women were left as household heads, with associated

livelihood and civic responsibilities to families and communities. Women's organizations played a key role in the development of the 2003 constitution: "...Rwanda has ratified and domesticated most international and regional laws that promote the rights of women" (Abbott and Malunda 2015). As a result, progressive inheritance and land laws give women equal rights with men to own and inherit property. Some 20 years later, however, despite having this legislation in place, many women do not know that they indeed have equal standing in this respect. Continuing constraints in access to education, training, employment (especially off-farm employment), and economic resources in general challenge the ability of women to realize full equality on a practical, day-to-day basis.

4.4.3 Gaps and recommendations

The following discussion of gaps and recommendations is focused on manageable activities, with an emphasis on multivariate data analysis and value added processing in key value chains with large potential for youth employment and youth-led business ventures.

First, limited multivariate data analysis concerning youth economic activities in key agrifood value chains presents a barrier to understanding youth workforce development at the nexus of agriculture, youth, gender, and economic activity. Future interventions should utilize existing census data and other ongoing data collection to carry out this type of analysis. Information on types of enterprises and jobs that develop and who obtains those jobs could be correlated and disaggregated along types of value chains and by characteristics of the workforce, e.g. age, sex, rural/urban, occupation, asset accumulation, and other dimensions of empowerment. Based on such initial analysis of existing data sets, census survey instruments can be enhanced for future data collection.

The second major gap with regard to gender considerations concerns the limited effort to integrate a gender perspective into the design of youth workforce development in key value chains. In general, programs should:

- Remove age-specific and gender-based constraints to improve young women's opportunities along the value chain, not only as producers, but also as entrepreneurs or employees in post-production processing activities, packaging, transport, wholesale, retail, food service, and hospitality enterprises.
- Research and share knowledge on gender-based constraints to agricultural productivity, utilization of food crops, profitable agribusiness enterprises and gender equity in employment throughout all priority value chains.
- Co-design country specific, gender-responsive employment programs with in-country partners and other key stakeholders to ensure interventions reach both young men and young women.
- Integrate gender analysis into the process and impact evaluation activities in order to share knowledge and feed back into project activities to maximize equitable impact.

Each specific value chain operating in the agrifood sector requires a tailored approach with regard to gender integration.

Each specific value chain operating in the agrifood sector requires a tailored approach with regard to gender integration. For example, an approach to address gender issues in a livestock value chain would differ significantly from that taken for coffee, tea, horticulture, and others. Using the coffee value chain as an illustrative example, recent research findings in Rwanda recommend:

- Engaging with (or facilitating the formation of) women's cooperatives and associations involved in coffee production, including facilitating long term leases for land and access to finance as needed. One especially strong benefit of working via women's cooperatives or associations is that when women have access to and control of washing stations, they can also maintain control of the sun-dried coffee after washing and hence are better able to ensure control of the income resulting from coffee sales.
- Implementing activities and measuring impact focused on the individuals within the household (i.e., not addressing the household as a monolithic unit).
- Employing an equitable number of women and men field staff.
- Utilizing a gender-aware approach to technical training and technical assistance (TA) content and logistics, including representations of women and men producers, training/TA location and dynamics, and language and literacy constraints.

- Conducting gender awareness training for both women-only and mixed cooperatives of women and men producers (e.g., to ensure awareness of land co-ownership for spouses, and the benefits of an equitable workplace) (IFAD 2010; TechnoServe 2012).

4.5 MAPPING OF NON-GOVERNMENTAL STAKEHOLDERS

This section examines the overall structure and dynamic of key programs for youth in Rwanda's agrifood subsector.

Communication and coordination of public and public-private organizations and programs is generally improving, according to key ministries and implementing NGOs/firms (international and local). Implementing organizations reported varying levels of success in linking with the private sector, with successful examples including collaborative internships and mentorships. The private sector is also beginning to influence curriculum development, albeit at the national level, via the Sector Councils, housed at the PSF, and MIFOTRA and the PSF collaborate in the MIFOTRA/TVET Internship Program. According to IDRC, the PSF sponsored business plan competition and that sponsored by MINICOM have significant overlap, and researchers at IPAR have recommended pooling resources to benefit from economies of scale and avoid duplication (IPRC 2015). An additional effort among GOR Ministries, donors, and implementing organizations includes planning efforts related to sustainability and scalability of workforce development efforts as discussed below.

The following sections will comment at greater length on various types of stakeholders involved in youth workforce development related to the agrifood sector, including government ministries and other units, international donors, international and local level NGOs, including civil society organizations at the most local, grassroots level, and agrifood businesses. Youth are considered, both as program participants and as implementing partners.

4.5.1 International NGOs/Firms (Economic Opportunities for Youth (EOY) project implementers for government and international donors)

International organizations implement EOY projects for a variety of donors and in collaboration with the GOR. Collaborations with the latter include close coordination with MINEDUC/WDA, MIFOTRA, MINICOM, among others, but for EOY activities in particular there was little mention of MINAGRI. However, MINAGRI's separate work in support of entrepreneurship and employment in key agricultural value chains does incorporate youth.

Agrifood activities are sometimes clearly identified as part of youth programming, including TechnoServe's activities in highly rural districts of Rwanda (TechnoServe 2012). In other programs, the agrifood sector may be present but itself "mainstreamed" throughout programmatic descriptions, as with Akazi Kanozi (EDC 2014). In the case of the latter, USAID supports Akazi Kanozi for out-of-school youth, while The MasterCard Foundation supports the scale-up of that same approach for secondary and TVET systems in the country. These and other donors also support capacity building for local organizations working directly with youth at national, district and community levels. The MasterCard Foundation also funds a STRYDE employment readiness approach on a pilot basis with university graduates.

International implementers in particular used very specific targeting approaches, including STRYDE and Akazi Kanoze projects. A related independent study assessed the potential for scaling up the Akazi Kanoze approach in particular, with activities based on best practices targeted to specific district populations (JBS International 2014; see also TechnoServe 2012).

4.5.2 Local NGOs/Firms and Civil Society Organizations (project implementers for GOR, local government, and international donors)

GOR agencies, international donors, and international NGOs all reported increased focus on strengthening local organizations. Examples include those led by the following two international implementers, among others:

- **Akazi Kanozi Access (AKA), a newly-formed and locally-led nonprofit.** Charged with building capacity for youth economic opportunity programming among highly local, grassroots civil society organizations and local governments, AKA is currently housed within the Akazi Kanoze project office space. AKA has launched their work into the next wave of development activities that international donors increasingly cite as emerging strategies for program scale-up and sustainability.

- **Spark[4], a European-funded nonprofit focused on youth in post-conflict countries.** Spark has facilitated the development of: 1) the "United Entrepreneurship Coalition", a network for strengthening the capacity of local partner organizations that, in turn, support very small and struggling, limited resource producers and processors; and 2) the Cooperative Support Programme, a network supporting more advanced medium scale businesses, now with clear potential to hire new workers, including rural youth, as well as an existing cooperative support network targeting districts and through them the business skills of over 1,000 cooperatives.

4.6 SUMMARY

This chapter has reviewed the economic, policy, and program landscape affecting current efforts to expand productive jobs for unemployed, underemployed, and disadvantaged youth in Rwanda's agrifood sector. In Rwanda, youth dominate the general population and labor force. Most still live in rural areas and work on small family farms, but youth unemployment and underemployment in both urban and rural areas is a rising issue.

During the 2000s, Rwanda's economic and agricultural policies contributed to strong GDP growth averaging eight percent between 2001 and 2014, accompanied by a twenty-point reduction in poverty. Now, Rwanda's severe land constraint limits further agricultural area expansion and especially youth access to land. A new strategy is required to foster continued economic growth that effectively engages young people and creates not only more, but more productive, poverty-reducing jobs for youth, both on and off the farm. Rwanda is attempting to address its youth and productive employment challenge by setting a target of 200,000 new off-farm jobs annually and taking steps to improve the coordination of related employment, skills and finance programs, many with an explicit focus on youth employment.

A number of issues and gaps were identified that must be addressed to expand the scale and effectiveness of youth employment and skills training programs, so that youth are better positioned to take up emerging opportunities outlined in Chapters 2 and 3.

First, youth perceive agriculture as a traditional, low-profit, backbreaking and unappealing activity, and do not recognize potential opportunities in the broader agrifood system, including input and farm service provision, marketing, processing, packaging, and food service. In Rwanda, the policy goal of 200,000 off-farm jobs annually is unfortunately often interpreted as "non-agricultural jobs" by government representatives and program implementers, even in rural areas, potentially neglecting opportunities to create productive employment for youth with strong growth and poverty implications. While Rwanda is an African leader in the application of ICT and other advanced technologies, which are appealing to youth, ICT applications for the agrifood system are not strongly promoted. However, efforts to introduce simple word-processing and spreadsheet programs through training programs for individuals and businesses appear to be underway.

Second, there is a significant gap between the skills demanded by the private sector and those supplied by formal and informal training programs. A 2012 survey by the Rwandan Development Board identified a fundamental mismatch in the supply and demand for skills in the agriculture sector, noting the country is producing managers and professionals, when the market requires technicians and trained artisans. Private sector stakeholders complain that potential employees lack substantial field experience and knowledge of emerging production technologies and/or skills in off-farm segments of agricultural value chains, including food processing, marketing, packaging, and food services. Greatly expanded and systematic engagement of the private sector with training providers is needed to inform curriculum development and increase opportunities for experiential learning through on-site internships and apprenticeship programs.

4 Not to be confused with Spark Microgrants, another international organization with which MSU did not meet.

Third, there are challenges in reaching out-of-school, rural youth via informal training, especially expanding the availability of informal training courses that are linked to institutionalized TVET and tertiary systems and are potentially more sustainable, or which carry the future possibility of qualifying as stackable courses that can help youth earn certifications. To reach out of work and underemployed youth, non-traditional recruitment strategies are essential. Given the weakness of the agricultural extension service in both countries, the ongoing provision of technical content through informal channels, including primary and secondary schools, associations, agribusiness dealers, and social media is important to keep youth updated on agricultural innovations and opportunities.

Fourth, SME development is a critical lever for connecting skills development and access to financial resources with real economic opportunities that lead to expanded youth employment, in line with agrifood sector comparative and competitive advantage in both countries and the opportunities discussed in Chapters 2 and 3. Access to land, equipment and finance are serious constraints for aspiring youth entrepreneurs. Two innovative programs introduced by Rwanda's MINICOM—the Hanga Umuriumo Program (HUP) and Community Processing Centers (CPCs)—are promising in their efforts to improve youth access to resources, and better coordinate training programs provided through different ministries and levels of government, and to link training with access to finance, equipment and other resources. However, youth entrepreneurs face a steep learning curve to start businesses, access finance and respond to market demands. The reluctance of financial institutions to lend to young agricultural entrepreneurs and high rates of startup failure suggest the importance of providing a longer-term "safe" incubator environment where young people can learn and practice essential technical and business skills as they are mentored, avoiding early catastrophic failure. Youth also need assistance to analyze market potential for their products, address policy and regulatory issues, and access specialized training and assistance to address emerging downstream agrifood business challenges, including meeting local and international food safety standards and developing appropriate, low-cost packaging.

Fifth, although youth and women constitute the rural majority in both countries, few existing analyses examine factors affecting the development of specific value chains using youth as well as gender lenses. Census data and other household and business establishment data could be used to track the development of specific priority value chains and their contribution to agricultural, economic, and workforce development goals, and determine what program interventions are most effective in improving the participation and success rate of target youth groups.

CHAPTER 5:
TANZANIA LANDSCAPE ANALYSIS

Julie Howard and Amy Jamison[1]

5.1 GENERAL ECONOMIC AND POLICY CONTEXT

One of the largest countries in East Africa, The United Republic of Tanzania is composed of mainland Tanganyika and the island archipelago of Zanzibar, which retains semi-autonomous status. Tanzania has a population of 51.8 million (2014) and a total land area of 945,087 square kilometers. Mainland Tanzania (Tanganyika) is the main focus of this report, as the center of agrifood system activities and growth opportunities for the country.

Tanzania's population is extremely young, with 54% of the population under 20 years of age, 63% under 25, and 77% under 35 (United Republic of Tanzania 2014a).[2] Although the country remains largely rural, this is changing with rapid urbanization over the past 20 years. Sixty-nine percent of Tanzanians lived in rural areas in 2014, compared to 80% in 1994 and 76% in 2004 (World Bank n.d.). According to some analysts, Dar es Salaam is the second most rapidly expanding city in the world, and secondary cities including Arusha and Mwanza are also growing fast (World Bank 2014).

5.1.1 Labor force and employment characteristics

Three-quarters of Tanzania's labor force works in small-plot, low-input, primarily subsistence—and therefore low-productivity—agriculture (African Development Bank 2011; World Bank 2016). The rapid rate of population growth and the youthful population distribution mean that an estimated 800,000 new people enter the labor market every year. Earnings per worker in Tanzania are among the world's lowest, and Tanzania's slow progress on poverty is not keeping pace with labor force growth (World Bank 2014).

Tanzania faces the dual challenge of achieving faster growth while accelerating the shift of its labor force to more productive work. As in other developing countries, and highlighted in Chapters 2 and 3, the relatively low overall unemployment rate masks the problem of widespread underemployment and the predominance of jobs in low-productivity agriculture and informal sectors. The major issue is not only how to create more jobs for youth, but how to create more productive and stable jobs that will pay well and help youth exit from poverty (World Bank 2014).

5.1.2 Despite solid economic growth, poverty rates are declining slowly, especially in rural areas

Tanzania has achieved impressive economic growth over the past twenty years. Real GDP growth rates increased from 3.3% in the early 1990s to an average of 7% by the late 1990s and through the 2000s (World Bank 2016, African Development Bank 2011). The economic progress follows reforms enacted by the government beginning in the late 1980s which changed the country's economic orientation from a state-led strategy to market liberalization (African Development Bank 2011).

Economic growth is mainly concentrated in urban areas and is being driven by a few capital-intensive sectors. These sectors, including mining, telecommunications, construction and banking, create a limited number of jobs, except in the construction industry (World Bank 2014, 2016). By contrast, the rate of growth of the labor-intensive agricultural sector, which contributes 25% to GDP and employs three-quarters of the labor force, is lower than other sectors. The growth in agricultural value added per worker is under two percent.

The overall poverty level in mainland Tanzania fell from 33.3% in 2007 to 28.2% in 2012, but rural poverty levels, though also declining, remained higher at 39.4% in 2007 and 33.4% in 2012 (World

1 The authors thank Regis Nisengwe for his excellent research contributions and assistance in planning field interviews.

2 The Government of Tanzania defines youth as individuals between the ages of 15 and 35.

Bank 2015a). The consistently lower-than-average rate of agricultural growth has led to this slow decline in poverty in rural areas, home to 80% of Tanzania's poor, a rise in inequality between urban and rural populations, and the acceleration in rural-to-urban migration. An estimated 12 million Tanzanians currently live in poverty (World Bank 2014, 2016).

A critical challenge for Tanzania is improving linkages with the rural sector that will translate strong economic growth into more and better quality jobs that can reduce poverty (African Development Bank 2011). A recent World Bank study affirms the importance of linking GDP growth with job expansion to sustainably improve worker income. For ten of 16 countries that achieved substantial reductions of poverty during the 2000s, rising labor incomes explained more than 40% of the poverty reduction (World Bank 2014). Although Tanzania is urbanizing rapidly, most Tanzanians still live in rural areas, and harnessing the synergies between rural and urban sectors will be crucial for Tanzania's economic development.

As the findings of Chapters 2 and 3 make clear, transforming the agricultural sector from subsistence to commercial farming can broaden the impact of economic growth, bring food and other agricultural products to urban and export markets, and create jobs throughout the agrifood system. However, Tanzania must address major challenges in order to accelerate structural transformation. These include alleviating infrastructure bottlenecks, especially for transport and energy, improving the enabling environment that currently impedes private sector development, enhancing the performance of the agricultural sector, and addressing the weak human resource base and skills mismatch (African Development Bank 2011).

5.1.3 Recent major natural gas discoveries present opportunities for growth linkages, new jobs

The recent discovery of major new offshore and onshore natural gas fields is expected to contribute significantly to Tanzania's future economic performance. Some analysts predict that the finds, some of which are in close proximity to Dar es Salaam, may add as much as two percentage points to GDP growth (Reuters 2016). Although the natural gas exploitation/gas flow and revenue streams will not get underway before 2022-23, there are more immediate considerations for Tanzanian planners that may affect how well the country is able to harness this major opportunity to link new energy-related investments to the creation of productive jobs and business activities that will reduce poverty.

Since the natural gas industry is not labor-intensive, relatively few direct jobs related to gas extraction will be created, and the skills needed for direct gas exploitation will be very specific to the gas industry. Job creation and local private sector growth will more likely occur through the development of upstream and downstream linkages. For example, the development of a liquefied natural gas plant and related gas infrastructure development can be expected to generate construction jobs most immediately. There will also be new jobs and economic activities in affected communities, including construction and business services, and, in the agrifood system, opportunities to meet the demand for increased food production, processing and food services, including food away from home (FAFH) in construction areas. Although the level of indirect jobs will drop after plant and related infrastructure has been completed, the negative impact can be minimized by planning from the beginning to connect these jobs to other sectors and to compete in other domestic, regional and international markets. Expanded natural gas availability in Tanzania will also create an opening to develop energy-intensive industries, including fertilizer production and cement manufacturing (World Bank 2014).

5.1.4 Economic policies seek to accelerate structural transformation and private sector investment

The Tanzania Development Vision 2025 and the Mpango wa Pili wa Kukuza Uchumi na Kuondoa Umaskini Tanzania (MKUKUTA I and II, or National Strategy for Growth and Reduction of Poverty I and II) are the guiding frameworks for Tanzania's economic growth and poverty reduction policies and programs (United Republic of Tanzania 1999). The Tanzania Development Vision sets out objectives and ambitious targets in five areas. These are high quality livelihood; peace, stability and unity; good governance; a well-educated, learning society; and a competitive economy capable of producing sustainable growth and shared benefits (United Republic of Tanzania 1999). The Tanzania Development Vision and the implementing frameworks described below feature broader goals and strategies related to growth and poverty alleviation, and include significant attention to the agriculture sector, but do not have a clear focus on jobs or youth.

MKUKUTA I (2005-2009) and MKUKUTA II (2010-2015) are the operational vehicles for achieving the Tanzania Development Vision and the Millennium Development Goals. MKUKUTA II focuses on enhancing productivity and growth to accelerate progress in reducing income poverty, identifies selected "growth drivers," including agriculture, and outlines sectoral strategies to promote productivity and greater private sector activity in these areas (United Republic of Tanzania 2010, World Bank 2011).

In 2012, the Government of Tanzania adopted Big Results Now! (BRN), to accelerate the implementation of national priority projects and the realization of the Tanzania Development Vision 2025, with a major emphasis on leveraging private sector investment (United Republic of Tanzania 2014). The BRN methodology includes prioritization with clear performance targets; rigorous implementation supported by detailed monitoring of performance data, and transparent performance management. BRN implementation began in July 2013 with six priority result areas: increasing agricultural productivity, improving reliability and access to power supply, reducing transport costs, improving quality of basic education, increasing access to rural water supply, and improving the business environment (United Republic of Tanzania 2014).

The BRN Initiative in Education prioritizes addressing lack of accountability, availability of teaching and learning materials, low levels of support for students and poor school management. Goals include improving pass rates in primary and secondary schools to 80% in 2015 (United Republic of Tanzania n.d.). The BRN Initiative in Agriculture addresses major constraints affecting agricultural growth, including the cumbersome, multi-agency, process to obtain land title; poor infrastructure; limited use of improved inputs; and few, poorly trained extension agents. Goals include ensuring an increase in output and quality of all products for which the country enjoys a comparative and competitive advantage, and to commercialize the sector to ensure nationwide food security and food self-sufficiency, while increasing incomes through domestic and international trade (United Republic of Tanzania 2013). The Southern Agricultural Growth Corridor of Tanzania (SAGCOT), discussed below, is a central focus of BRN-Agriculture.

5.1.5 Youth employment, skills policies and programs

The National Youth Development Policy, enacted in December 2007, provides the framework for youth policy in Tanzania, and updates a previous policy dating from 1996. The Ministry of Labor and Employment (formerly the Ministry of Labor, Employment and Youth Development) developed and until recently had the mandate for overseeing youth development issues in Tanzania. The policy recognizes the core problem of youth unemployment and seeks to work with the private sector to establish employment opportunities and promote the culture of youth entrepreneurship (Rutta 2012). Key objectives include facilitating youth to acquire relevant skills and competence for employment, and to practice good values, ethics and good conduct. The policy also seeks to engage youth in decision making and provide youth-friendly social services (Rutta 2012).

Following the presidential transition in late 2015, labor and youth employment portfolios moved to a higher profile within the Prime Minister's office to improve coordination and implementation of youth-related programs across ministries and at different levels of government, including regional administration, local governments, and national-level ministries. In addition, stakeholders noted that a new draft National Strategy for Youth Involvement in Agriculture will be completed in 2016. It is anticipated that the Ministry of Agriculture, Food

Security and Cooperatives (MAFC) will lead strategy implementation, with collaborating ministries to include Lands, Housing and Human Settlements Development; Labour and Employment; Water; Industries and Trade; Regional Administration and Local Government; and Livestock and Fisheries Development, together with private sector businesses and associations. The strategy is expected to focus on issues of youth access to land, financial resources, technologies and markets to facilitate youth investment in agriculture.

One of the key public sector organizations for small-scale enterprise development, for youth and in general, is the Small Industries Development Organization (SIDO), part of the Ministry of Trade, Industry and Marketing. SIDO designs and implements programs to develop the small industry sector in Tanzania, including in the agrifood system. According to interviewed stakeholders, SIDO programs are well-regarded and effective, providing access to technology, training, marketing, and successively higher levels of financing to new entrepreneurs, existing enterprises, and business service providers. Training programs focus on entrepreneurship skills, business management skills, and acquisition and upgrading of technology, e.g., in food processing and preservation, leather products, and cashew nut processing (SIDO n.d.).

5.2 TANZANIA'S AGRIFOOD SYSTEM

Agriculture contributes 25% of Tanzania's GDP, 30% of export earnings, and employs three-quarters of the labor force. The sector is currently characterized by rain-fed, low productivity subsistence agriculture. Ninety-one percent of the land under cultivation is managed by smallholders farming 2 ha or less, and average crop productivity is 1.7 tons/ha, less than half the potential productivity of 3.5 to 4 tons/ha (Hepelwa et al. 2013). Fertilizer use and application rates are far below other African countries with similar conditions. Only 12% of farmers use chemical fertilizer. Tanzania uses an average of 9 kg/nutrients per hectare, compared to Malawi's 27 kg/ha and South Africa's 53 kg/ha (AFAP 2012, cited in Hepelwa et al. 2013).

Cereals, including maize and rice, dominate total planted area in Tanzania (61%), followed by roots and tubers (14%), pulses (12%), and oilseeds (7%). Coffee, tea, cotton, cashews, raw tobacco, sisal and spices are the main exported cash crops. Using data from the Tanzania National Panel Survey of 2008-2009, Covarrubias et al. (2012) assessed the role of livestock in rural smallholder households of Tanzania. While every rural household cultivates crops, most rural households also have some livestock. About three in five households report earning income from livestock production totaling, on average, about one-fifth of total household income. Poultry ownership is nearly universal and makes up the bulk of livestock holdings for poorer households. Cattle ownership is limited to about one-third of households, which tend to be better-off. Disease is a major constraint to livestock profitability, with access to veterinary services difficult. The rate of vaccination is low, 29% overall, and higher among poorer households. Covarrubias et al. report that with regard to gender, women managing livestock earn less from their livestock, managing fewer numbers, except poultry, and are less likely to vaccinate or use other inputs including labor and fodder (Covarrubias et al. 2012).

5.2.1 Conditions are favorable for a significant expansion of Tanzania's agriculture sector

Only one-third of Tanzania's 44 million hectares of land suitable for agriculture is currently being cultivated. The country has good rainfall and soil conditions, one of the largest livestock herds in Africa, and the potential to export to growing regional and international markets through an expanding road, rail and air network. While the use of improved agricultural technology is currently low, stakeholders interviewed cited a number of technologies that have the potential to increase yields and productivity of strategic commodities and which are increasingly known and accessible to smallholders. These include improved maize, oilseed, and root and tuber varieties which are being made available through private seed companies and distributors, improved horticulture technologies such as drip irrigation, greenhouse management and integrated pest management, and improved feed and management practices for small-scale poultry operations.

Further, consistent with findings in Chapter 3, Covarrubias et al. find that in Tanzania, while the share of food in total household expenditures declines as income rises, the importance of livestock-related purchases in total household expenditures and in total food expenditure increases with rising incomes. The overall level of per capita livestock product consumption in urban areas is about twice as high as for rural households, and is purchased rather than self-produced. Urban households consume about twice as much meat, poultry and dairy products

as rural households, and four times as many eggs. Covarrubias et al. indicate that the disparities in livestock product consumption between rural and urban areas, and between different income groups, suggest there is considerable scope for expansion by livestock producers to serve the growing domestic market, if constraints, particularly the low level of input use and veterinary services, can be addressed (2012).

In general, and aligned with the findings of Chapter 3, stakeholders interviewed noted the critical importance of creating market and processing linkages with growing urban areas, and new and expanding energy and mining operations, to translate Tanzania's considerable agricultural potential into rural growth and increasingly productive jobs for youth.

5.2.2 Guiding agricultural policies, frameworks and programs

A series of agriculture-sector specific development strategies and programs related to Tanzania's Development Vision 2025 have been developed since the early 2000s. Most have recognized the central role of youth in agriculture, and more specifically the need to expand youth engagement to introduce new technologies and management that will improve agricultural productivity, and provide options to youth who are fleeing from rural areas but failing to find higher-quality employment elsewhere.

The objective of the National Land Policy, developed by the Ministry of Land and Human Settlements Development in 1997, is to promote a secure land tenure system to encourage the optimal use of land resources and facilitate broad based socio-economic development which is environmentally sustainable (Rutta 2012). The National Land Policy also strives to ensure that existing rights in land, especially customary rights of smallholders and livestock owners are recognized, clarified and secured in law. Although Tanzania is rich in agricultural land, the continuing problem of access to land by youth, private investors, and women was raised repeatedly by interviewed stakeholders as a critical constraint to improving agricultural performance and increasing investment. This finding strongly aligns with Chapter 2's conclusion that access to land represents a critical constraint to expanding youth employment and increasing agrifood system productivity more generally.

Among the initiatives promoted by the Tanzania Agricultural Sector Development Strategy of 2001 (ASDS) were collaborative efforts by agriculture, water and livestock ministries to incorporate agriculture and livestock production subjects in primary and secondary school curricula in order to promote technology adoption and youth interest in agriculture. Regional and local government entities were to facilitate private sector development of agro-industry to provide employment to youth. The Agricultural Sector Development Programme (ASDP) was subsequently launched in 2006. Through ASDP, local governments implemented District Agricultural Development Projects in all districts which provided grants and technical support to village-based agricultural projects (Rutta 2012).

Access to land represents a critical constraint to expanding youth employment and increasing agrifood system productivity.

The Kilimo Kwanza (Agriculture First) Initiative was launched in 2009 to accelerate the progress of the ASDP (2006) by facilitating private sector investment and improving the coordination of public resources to improve farmer access to agricultural knowledge, technologies, marketing systems and infrastructure. Kilimo Kwanza has ten pillars which serve as an implementation framework, with each pillar tasked with activities and responsible government agencies. The initiative highlights youth issues in agriculture, particularly through Pillar 8, Science, Technology and Human Resources. Included among proposed pillar activities are agricultural loans and land for agricultural graduates; full scholarships for agricultural undergraduates; and incentive programs to attract youth into agriculture (Rutta 2012). While Kilimo Kwanza received considerable political support from the private sector and the donor community, the initiative has been criticized by some Tanzanians, including youth, as a political effort designed to win support for the government, while accomplishing little for Tanzanian farmers or rural youth (Rutta 2012).

The Tanzania Agriculture and Food Security Investment Plan (TAFSIP) was launched in 2011 under the framework of the Comprehensive Africa Agriculture Development Program (CAADP) to coordinate the implementation of existing and

new development initiatives in agriculture and food security. TAFSIP supports Vision 2025 and the ASDS. The overall objective is to achieve 6% annual agricultural growth through smallholder-engaged programs. The government of Tanzania has committed to investing 10% of the national budget in agriculture per year (TAFSIP n.d.).

The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) is a major focus of BRN-Agriculture, discussed above. SAGCOT is a platform intended to allow networks of stakeholders to align and coordinate their investments and interventions to address multiple bottlenecks in agriculture within a defined, but large, geographic area across southern Tanzania. Launched in November 2010, the SAGCOT Investment Program has been highlighted at the World Economic Forum, G8 meetings, and at the Grow Africa, which is the New Partnership for Africa's Development initiative to stimulate private investment. SAGCOT seeks to attract USD 2.1 billion of new investment over the next 20 years, creating at least 420,000 new jobs and drawing more than 2 million out of poverty. SAGCOT explicitly addresses two major constraints—on-farm productivity and lack of market access—and promotes the commercialization of smallholder farmer systems and expansion of domestic agribusinesses (World Bank 2016).

Given the international publicity received, SAGCOT has been viewed by some as an effort to encourage new international agribusiness investment. While new investment is sought by Tanzania, interviewed stakeholders emphasized that the main principle underlying SAGCOT is broader. Although SAGCOT is relatively new and results are only now emerging, it is focusing on the creation and expansion of sustainable partnerships with agribusinesses that will draw smallholder farmers and rural youth into commercially viable value chains. The aim is to accelerate broad-based agricultural growth that creates productive jobs and lifts people out of poverty.

A 2014 joint sector review of Tanzania's agricultural sector policies and programs by NEPAD (2014) found that the high-level priorities, policies and programs launched by the Government of Tanzania, including MKUKUTA, ASDP I, Kilimo Kwanza, BRN!, were evidence of its strong commitment to improving sector performance, and in line with the CAADP pillars agreed by African heads of state in 2003 in Maputo. However, the review observed the many overlaps among these commitments, and the need for more effective coordination and collaboration to benefit from synergies and value addition among the programs (NEPAD 2014). In addition, NEPAD noted that an effective system is needed to monitor and evaluate how various agricultural stakeholders are performing on their commitments. While Tanzania has a number of review processes aimed at achieving different objectives within the agricultural sector, better collaboration among various stakeholders involved in the existing reviews is needed. For example, data collection, analysis, and interpretation would be enhanced and cheaper if the systems shared responsibilities and expertise. In addition, the review noted the central role of private sector and other nonstate actors in financing, designing, and implanting agricultural programs and the importance of defining a better mechanism for including them in the policy formulation, planning and programming, monitoring and evaluation, and review process.

A separate assessment of International Fund for Agricultural Development (IFAD) investments in support of ASDP found benefits to supporting agriculture sector-wide programming with a national scope, including (i) implementation through local governments, which helped strengthen local extension capacity; (ii) lower management costs compared to the alternative of implementing 15-20 separate projects; and (iii) reduced transaction

costs for the Government which otherwise would have had to deal with several projects supported by different donors, each with different procedures and reporting requirements (IFAD 2015).

In summary, the NEPAD and IFAD reviews point to a number of lessons from the Government of Tanzania's experiences with ASDP and other agricultural policies and programs. Specifically, the lessons learned from coordinating diverse government agencies and donors will be relevant as the government and its partners grapple with the challenge of prioritizing, coordinating and improving the effectiveness of youth employment programs across many agencies and implementing partners.

5.2.3 Access to agri-finance

Although more than 50 commercial banks operate in Tanzania, the agriculture sector remains critically underserved. The Economic and Social Research Foundation estimates that only three percent of agricultural households have access to credit and other financial services. The commercial banking sector views agricultural loans as relatively risky compared to other sectors. Most rural smallholders lack title to their land and are unable to use it as collateral. In Tanzania, all land is owned by the government, and the great majority of agricultural land is controlled by the provisions of the Village Land Act of 1999. A very small proportion of the land is held through a long-term certificate of occupancy which functions as a de facto title. However, most rural agricultural land is held as "village land" and is unsurveyed and untitled, with traditional usufruct rights organized within the village itself (Simbakalia 2012, SAGCOT n.d., All Africa 2014). In August 2015, the Tanzanian Agricultural Development Bank (TADB) was launched to expand the availability of short, medium, and long-term loans and other services to the agricultural sector. TADB responds to Vision 2025, and the bank is envisioned as an apex agricultural development bank, catalyzing other banks and financial institutions to invest in agricultural value chains, and in particular to the smallholder sector. TADB is also charged with developing policy, legal and regulatory frameworks for the sector.

In addition, a non-governmental organization, the Private Agricultural Sector Support Trust (PASS) has been operating since the early 2000s to stimulate investment and growth in commercial agriculture, PASS provides financial and business development services to small and medium agribusinesses, linking them to financial institutions (PASS n.d.). PASS started in 2000 as a $2 million loan guarantee fund, targeting loans that banks consider too high-risk. The guarantee fund now stands at $50 million, which has been leveraged to cover $150 million in loans. According to stakeholders interviewed, PASS lends to smallholders organized in groups, and has contributed to a significant reduction in the loan default rate. Stakeholders credit PASS with helping financial institutions build their capacity to lend to the agriculture sector, including learning how to structure repayment appropriately. PASS collaborates with Sokoine University of Agriculture and a network of service providers, including technical experts from Ministry of Agriculture technical institutes to provide technical training and BDS services. Up to now, however, PASS has not focused on youth.

5.2.4 High-potential value chains

Separate analyses by the World Bank and USAID used several distinct methodologies to estimate comparative advantage of a number of commodities in Tanzania. Indicative results from the World Bank analysis follow (World Bank 2014; COMPETE 2009):

- Through the application of the Growth Identification Framework (GIF) to Tanzania, which compares growth trajectories of countries showing similar characteristics in the past, in this case China and East Asian countries, suggests that Tanzania will have an advantage in the following products: horticulture, aquaculture, dairy, edible oil, soap, hides, skins, leather, wood, cotton (World Bank 2014).
- In addition, a preliminary examination of the potential for import substitution of main agriculture-related products imported by Tanzania, but for which it may possess a potential competitive advantage in producing for local and export markets, suggests potential focus areas for Tanzania of wheat, sugar, and fertilizer (World Bank 2014).
- Examining employment generation multipliers, the job creation impact is estimated to be about three times higher for value-added horticulture than for more traditional cereal crops.

The combination of these approaches suggests that high value vegetable and fruits, processed grains, wheat and meat; as well as light manufacturing of wood, paper, and leather processing, and tourism best reflect Tanzania's comparative advantage (World Bank 2014).

The USAID Competitiveness and Trade Expansion (COMPETE) analysis used a combination of quantitative and qualitative analysis to identify high-impact sectors that would also have a high impact on poverty reduction, food security, offer viable business opportunities, and manageable external risks. Key sectors identified were rice, maize, pulses, and high-value exported vegetables (COMPETE 2009).

The results of these analyses are generally consistent with findings from Chapter 3. For Tanzania, Chapter 3 found that "best bets" (fast growth from a substantial base) included commodities that would make up food consumed away from home, including a wide range of flours and other processed commodities; low processed perishables, including meat, poultry, fish, eggs, and related feedgrains. The next most promising group, the "steady set," also with good potential, include fresh fruits and vegetables, fresh fish, and fresh fruits and tubers. Locally produced vegetable oils may substitute for imported oils.

MSU heard repeatedly from stakeholders that in order to interest youth in on-farm production or business incubation, key characteristics are short-term turnover, ready access to the market, high profit margins and access to adequate land or equipment. In Arusha, youth have formed groups to access land and produce high-quality vegetables for the export and restaurant market. In the Southern Highlands, a chicken processor and a feed company are teaming up to organize training and in kind short-term "loans" of chicks, feed and vet services to individuals and groups who can raise broilers on contract. Other stakeholders considered that production of fish for fresh consumption or dried would also be of interest to youth. In Morogoro, SIDO and SUGECO have test kitchens and production incubation facilities for the production of enriched flours, snack foods, teas and spices that are used by youth and women.

5.2.5 Constraints to SME agribusiness growth

Chapter 2 discussed the importance of harnessing the process of agricultural transformation to create more broad-based economic growth and more productive jobs along the agricultural value chain. As a potential model for Tanzanian agrifood system development, Thailand and Vietnam accomplished this by diversifying from food staple crops to higher value commodities to enter value-added supply chains, e.g., from maize to vegetables and poultry. As Thailand was urbanizing and growing wealthier, it was also able to increase the number of good quality agricultural jobs from 519,000 in 1960 to nearly 3 million by 2008 (World Bank 2014). Also potentially instructive for Tanzania, in Thailand, Vietnam, and other successful countries that are now middle-income, small start-up businesses, on and off farm, have been a major source of employment creation. In these and other middle income countries, new firm registration rates are 10-20 times higher (relative to population) than in most African countries. According to World Bank estimates, if only 20% of existing small non-farm businesses (two employees or less) can double their employment base, this would lead to the creation of almost one million new jobs, with additional employment created through indirect growth linkages (World Bank 2014).

As discussed in Chapter 3, agro-processing is already a dominant manufacturing sector in Tanzania, including beverages, fish products, grain mill products, and fats and oils, and has considerable potential for expansion to meet the demand for FAFH and other commodities. However, the sector faces constraints which limit its growth, including the availability of good quality agricultural products, difficult access to land and finance, and the tendency to export products without processing—giving up potential jobs and value added activities. Tanzania also now imports significant amounts of dairy and edible oils which could be supplied domestically (World Bank 2014).

Potential approaches to address these constraints and grow SME agribusinesses and employment in Tanzania's agricultural sector identified in the desktop review and by sector stakeholders include:

- Facilitate contract farming to increase smallholder access to inputs and connect her to the agro-processing industry. In the SAGCOT region, companies are beginning to apply the traditional model of contracting for beverages, cotton, sugar and tobacco to contract with smallholders for poultry and feedgrain production. In Arusha, smallholder contracts for high-value export vegetables are common. Cost-effective training and continual introduction of new technologies and food safety oversight is a major issue.
- Advance cluster formation to create the needed scale for road, electricity improvements and other market links. SAGCOT envisions the development of six clusters (SAGCOT n.d.; World Bank 2014).

- Improve regulatory standards and upgrade the capacity of the Tanzanian Bureau of Standards and Food and Drug Authority to implement them, register new products and provide training including food safety.
- Increase the availability of testing laboratories in Tanzania for soil tests and food safety. Samples currently must often be shipped abroad, at high cost.
- Expand experiential training for food processing that meets international safety standards. Few courses are currently available through SIDO and VETA and small donor-funded programs.
- Develop cost-effective local packaging options for agro-processing products. Imported packaging currently represents a major expense to small firms.

5.3 SUPPLY OF WORKERS

5.3.1 Education stocks and flows

Tanzanian youth, which the Government of Tanzania defines as those who fall between the ages of 15 and 35, comprise approximately 67% of the country's labor force[3]. The level of education attained by the majority of Tanzanian youth remains relatively low. Primary school enrollment is currently around 16% of the country's total population with a gross enrollment rate of 93% (Minde et al. 2015). This number indicates Tanzania's progress towards universal primary education; however, as of 2014, the transition rate from primary to secondary school was only approximately 41% (FHI360 National Education Profile). This means that less than half of youth who attend primary school will successfully enroll in secondary school. Those who do not transition to a higher level of education will presumably enter the labor market with only a primary school education (and some with less than this: it is estimated that approximately 11% of youth have no formal education and 15% of youth have attained at most incomplete primary education) (FHI360 National Education Profile).

For higher levels of education, only one pupil in four will transition from lower secondary (Form IV or O-levels) to upper secondary (A-levels) and of those who complete upper secondary, 8% will go on to some form of tertiary education (Minde et al. 2015). While Tanzania has introduced a new policy (Education and Training Policy 2014) to reform the country's educational system and make transition between primary and secondary school smoother by doing away with the Standard VII examination and making secondary school compulsory and free, the capacity of Tanzanian secondary schools to expand enrollments and the current quality of education and its relevance to the job market remains in question. Without improved educational transition and educational quality, the proportion of highly skilled youth entering the labor market is likely to remain low.

In addition to traditional secondary education, Tanzania also has a fairly well developed technical and vocational education training system which is managed by two entities, the Vocational and Education Training Authority (VETA) and the National Council for Technical Education (NACTE) which are both under the Ministry of Education and Vocational Training. VETA provides post-primary vocational training programs while NACTE regulates and accredits all postsecondary and higher technical institutions. Currently, the only training programs related to the agrifood system in either of these systems are in tourism (NACTE & VETA) and agricultural mechanics (VETA). There are no training courses at the post-primary, pre-tertiary level in agricultural production, processing, or services.

Without improved educational transition and educational quality, the proportion of highly skilled youth entering the labor market is likely to remain low.

Within the formal educational structure, agricultural skills training programs are only available at the tertiary level. The Ministry of Agriculture, Food Security and Cooperatives oversees 14 training institutions (MATIs) that offer diplomas and certificates mainly in courses related to agricultural production. These institutions were primarily designed to train agricultural extension workers. Sokoine University of Agriculture (SUA) was for many years the only public university offering agriculture and agrifood related programs. However, in early 2016 the University of Dar es Salaam launched a new College of Agricultural Sciences and Fisheries Technologies. A few private institutions with agrifood programs are also beginning to emerge, such as the Nelson Mandela African Institute of Science and Technology.

3 Tanzanian population and housing census (PHC 2012) taken from the draft Ministry of Agriculture youth strategy document.

There are few agriculture skills programs at the primary level and the majority of youth entering the workforce are doing so after completing only primary or perhaps some secondary education, meaning the majority of youth are not formally trained in agricultural skills. In interviews, stakeholders from both educational and employer institutions reported that most youth who entered into agriculture learned their skills from parents and grandparents, meaning they learned "traditional" farming methods with little access to information and skills related to updated technologies and best practices.

Interviews with stakeholders also revealed that the formal educational system is not adequately training students in soft skills and entrepreneurial skills. Other government agencies, NGOs in cooperation with donors, farmers' associations and cooperatives, and private employers have begun to fill this educational gap by providing both agricultural skills and business or entrepreneurship skills to youth from a range of educational backgrounds through short-term and long-term training programs, internship programs, and other on-demand training opportunities.

5.3.2 Education and employment

While youth unemployment is a major challenge in Tanzania, underemployment is increasingly prevalent. Agriculture is the top employment field in Tanzania. It contributes 25.3% of the country's GDP, but accounts for 74% of employment. Youth who are employed have a high tendency to be in low-skilled agricultural jobs and in informal work (IDRC). Rates of youth unemployment and under-employment are impacted by a lack of high-level skills development and educational attainment among Tanzanian youth. Of those who are classified as having vulnerable employment by the Tanzanian National Statistics Bureau, the vast majority have only completed primary school or less. Of the over nine million youth in vulnerable employment, it is estimated that 7.4 million have only primary education or below. The World Bank estimates that each additional year of education increases a young person's chance of finding a job by 10% (World Bank 2012). Therefore access to educational opportunities and relevant skills is crucial to improving youths' ability to access stable employment.

Where youth have access to educational opportunities, often the education they receive does not align with labor market demands. Tanzania's Education and Training Policy (ETP) 2014, as well as other education sector reforms, now recognize the disconnect that has existed between educational institutions and the labor market and seeks to address the need for private sector input into curriculum. This change, however, has been slow and the traditional educational system has made little progress in building connections to the private sector and employers. VETA is an exception—it has a Directorate of Labor Market, Project, and Development which conducts labor market analyses to upgrade course offerings and content. There is also a private sector advisory board to provide employer input and feedback on the quality and relevance of the trainings VETA offers. Interviews with stakeholders uncovered conflicting opinions about whether this private sector input is making a substantial and positive impact on updating VETA curricular programs. One employer interviewed gave a positive review of the agriculture mechanics program graduates in his employ.

There are also conflicting reports about the employability of graduates from technical training institutions. In a 2013 World Bank report, Sabarwal cites a 2001 study saying that post-TVET employment rates in Tanzania were only 14% (Sabarwal 2013). However, a Vocational Education and Training (VET) 2010 tracer study of 5000 graduates involving 18 to 29 year olds indicates that approximately 80% of graduates had found employment. According to this study, those entering agrifood related fields approached 90% employment (Education for All 2015). Employment rates for MATI and SUA graduates were not available although interview data and a SUA tracer study indicates that employers perceive a skills mismatch between the education graduates acquire in these institutions and the demands of the labor market.

Data from a 2013 employer survey conducted in conjunction with the World Bank indicates that firms in agriculture and trade are much more likely to have a majority of employees with only a primary school education than those in the service sector. Thirty-six percent of agriculture employers reported having no employee with post-secondary education as compared with service firms; only 17% of these firms employed no one with tertiary degrees. The study also found that companies within the agriculture sector were also less likely to invest in training for employees. Sixty-one percent of agriculture firms reported providing employee training. As may stand to reason, smaller firms were more likely to have lower skilled employees and offer

little or no training opportunities (Sabarwal 2013). However, as noted later in this chapter, the skills demanded in the agriculture sector are changing with the growing demand for processed foods and as more firms enter the post-production segments of agricultural value chains.

5.3.3 Skills needed by employers or as entrepreneurs

As previously described in Chapter 4 and illustrated in Figure 4.3, researchers have generated a global framework for the types of skills sought by employers and needed for entrepreneurs (Workforce Connections 2014). These fall into three essential areas: foundational (literacy, numeracy); technical (e.g. food safety, processing, packaging, food service, marketing); and work readiness related or "soft skills" (WC 2014). Soft skills include communication skills, behavioral skills and many skills needed to be a successful entrepreneur such as management ability, self-discipline, adaptability, and time management. Business, financial, and computer literacy cross-cut all of these skills categories.

In the 2013 World Bank employer survey, researchers asked questions about skills that are hard to find in Tanzania. They found that numeracy (36%), behavior skills (34%), interpersonal skills (30%) and job-specific technical skills (28%) top the list of what Tanzanian employees lack. A 2015 survey of stakeholders conducted by SUA revealed that while their graduates are "trainable and adaptable to the work environment," they lack practical technical skills, entrepreneurship skills, ICT literacy, financial skills, critical thinking skills, confidence, English-language skills and the ability for self-learning. Interviews with stakeholders confirmed these findings. Students graduating from SUA and the MATIs have theoretical training, but do not have the practical and life skills for immediate employment or successful entrepreneurial endeavors. Even students graduating from the vocational training system are critiqued for lacking practical, technical, and entrepreneurial skills (IDRC; World Bank 2014, Sabarwal 2013). Except for basic literacy and numeracy, primary education provides little to no training on soft skills and technical skills. All of these students require further training post-graduation to adapt to the practically-oriented environment of the labor market.

5.3.4 Capacity building in the TVET system

The educational sector in Tanzania at all levels has plans to address the skills gap described above. As mentioned previously, VETA has created mechanisms for channeling private sector input into their curriculum design and validation and training, including instructor training. Tanzania's BRN framework is also pushing the country's technical and vocational education to be more streamlined and connected to the private sector. Additionally, VETA is planning to expand the types of programs that they offer to include entrepreneurship skills and on-the-job experiential training in line with the country's new educational policy and training strategy. For example, in cooperation with the Association of Tanzania Employers, they have piloted an internship program in tourism and hospitality. Currently, however, VETA has very few agricultural or agrifood-related programs, and it is not clear whether they will develop these offerings in the future.

The USAID-funded Innovative Agricultural Research Initiative (iAGRI) program is currently working to strengthen the training and research capacities of SUA, which includes mentoring students, promoting innovative research skills, and strengthening the university's private sector linkages. The iAGRI Innovation Portofolio connects the university to the private sector to commercialize "innovative products, services, processes, and infrastructure." iAGRI is also working "to package post-graduate student theses as an 'investment portfolio' to be marketed to food system firms seeking applied scientific knowledge for investment and operations."

Government agencies outside of education, NGOs in cooperation with donors, farmers' associations and

cooperatives, and private employers have stepped up to fill the gap in skills among youth entering the labor market. These efforts will be described in more detail below.

5.3.5 Skills gaps and future skills development

As mentioned above, a skills gap exists in Tanzania between what employers are seeking or, in the case of entrepreneurs, the skills that will make them successful, and the current skills provided in both the traditional and the technical/vocational education system. There emerged a consensus from stakeholders interviewed that students entering the labor market by and large did not have the practical, technical, or business/management skills necessary to work nor to run their own businesses.

On-farm agricultural jobs related to production usually require less specific level technical skills than the downstream segments of the agrifood system, such as food processing, packaging and distribution (Minde et al. 2015). As the agrifood system changes, the number of jobs and demand for firms in upstream and downstream segments of agricultural value chains will continue to grow. This means that increasingly high-level skills will be in demand. If the current educational system does not evolve to deliver these skills effectively and efficiently there is the real possibility that Tanzanian youth could fall further behind in terms of their ability to obtain secure and well-paying employment.

Youth often remain unaware of current opportunities in the agrifood system, especially in areas like processing, marketing and other downstream activities, and they do not know how to prepare for them or where to seek skills.

Although agriculture is the largest field of employment for Tanzanians, youth often express reluctance to enter into vocations in the agrifood system. Employment in agriculture is often seen as a "default" career and not one in which youth feel they can make a decent living and/or gain prestige. They understand agriculture to be the traditional forms of hand-hoe farming that their parents and grandparents undertook. Youth often remain unaware of current opportunities in the agrifood system, especially in areas like processing, marketing and other downstream activities, and they do not know how to prepare for them or where to seek skills. They lack role models of successful youth agricultural entrepreneurs as well as networks for taking advantage of agrifood system entrepreneurial opportunities. This current youth mindset and lack of understanding of the evolving opportunity trends in the agrifood system prevents youth from seeking the necessary skills to participate fully in the agrifood labor market.

5.3.6 Promising practices

Several promising practices emerged in the landscape analysis conducted in Tanzania as well as the desk literature review. In the past two years, several donors, NGOs, and government departments have increased their focus on youth and devoted resources to youth-focused programs. A number of programs are addressing the skills gap that exists, especially in terms of entrepreneurial skills, soft skills, and financial/business management skills. A few also focus on building the technical capacity and networks of youth in the agriculture sector, including offering mentoring and internship opportunities. Many are addressing not only training needs, but access to credit, land, and markets.

A number of professional and farmer associations have taken on providing technical skills training in specific commodity value chains. These associations work in conjunction with the MATIs and with SUA, the University of Dar es Salaam, and other higher education institutions who provide the technical expertise, current research, instructors, and in some cases facilities to conduct the trainings. In horticulture, the Tanzanian Horticulture Association provides on-site training and on-demand advice to member farmers through their staff agronomists. This hands-on, on-site training is particularly effective. One tractor dealer has developed and is utilizing a model of on-site training for farmers who purchase their tractors. The company has trainers on staff who will travel to the farmers' fields to give them hands-on individual training on tractor operation, maintenance, and financial skills for a total of seven days over the course of the first year of ownership. They see a built-in incentive for providing this type of training since their business relies on farmers' success and their ability to pay their tractor loans. While this is currently a pilot program, the problem-solving and individual farmer engagement approach looks promising.

Other implementing organizations in the government of Tanzania and the NGO sector, both local and international, are beginning to deliver comprehensive programs that address training needs as well as look at the success of youth in the agricultural sector in a more holistic way. Most successful were programs that included mindset transformation toward the agriculture sector and self-motivated critical thinking, agriculture skills training, and business training as part of a comprehensive package. This package is tightly linked to the development of a specific business plan, access to finance with oversight, and continuing mentorship and extended access to land and/or shared facilities as youth gain experience. While it is a significant undertaking to provide these wrap-around services, a number of organizations are beginning to utilize this model. The AgYees team saw several promising programs delivered by both local and international organizations. More details about specific organizations will be discussed in Section 5.5.

Finally, communication among the various sectors emerged as a key to success. Educational and training institutions who worked with the private sector to provide curricular input, as well as internship and mentoring opportunities have slowly begun to see improvement in their students' practical skills.

5.3.7 Challenges remain

As mentioned in Chapter 4 of this report, the IDRC did a broad scoping of research gaps and knowledge needs in both Rwanda and Tanzania. In Tanzania, they identified:

- Lack of evidence on the success of youth employment programs and scaling up efforts;
- Need for better coordination of interventions and programs;
- Need for a deeper understanding of the recruitment process and job profiles by sector (links to training and job placement initiatives);
- Evidence gap in evaluation (documentation of what has worked and what has not) and lack of evidence sharing among partners;
- Definition of youth is movable which impacts data collection; and,
- Lack of knowledge on impact of new technologies, migration, and gender gaps in youth job markets.

Interviewees confirmed several of these gaps in knowledge. The need for an information-sharing platform to communicate, share best practices, and avoid duplication of efforts was a key theme. Several stakeholders asserted that some type of coordinating entity or forum to communicate across organizations would likely impact the effectiveness of programs and the number of Tanzanian youth that they reach. They also highlighted the importance of evaluation data and measures of "success".

Under Tanzania's new government elected in 2015, public youth initiatives have begun to be consolidated under the auspices of the Prime Minister's office. The 2015 agreement signed between the National Economic Empowerment Council (NEEC) and the Tanzania National Service and their directive to work closely with SIDO and VETA is additional evidence of the government's attempt to coordinate youth employment and empowerment initiatives. Finally, cooperation between NEEC and the Tanzania Competitiveness Centre (TECC) and Youth Business International to implement the Kijana Jiajiri program further demonstrates a movement towards better coordination. Kijana Jiajiri or "youth self-employment" is a government-initiated five-year program that seeks to support underserved young entrepreneurs across Tanzania by providing training, mentoring, and access to finance. These examples are first steps in bringing together public entities addressing youth and NGOs. These initial efforts could be built upon to launch an information-sharing platform that promotes better coordination and avoids duplication for all actors in this sector.

5.4. GENDER CONTEXT

Women make up three-quarters of the agricultural labor force in Tanzania (Komatsu 2015, IFPRI, WEAI). However, they are more likely than men to leave school after primary level and have limited involvement in production decisions and access to resources. For this reason, Tanzanian women are more disadvantaged in terms of decent work and income generating opportunities (FAO 2014). This section will analyze the data available and data gaps for men and women youth in the agrifood sector, discuss key gender-based constraints that emerged from the review of literature and in-country stakeholder interviews, and finally consider remaining challenges and recommendations.

5.4.1 Overview of relevant data availability and gaps

The Tanzania National Board of Statistics (NBS) provides access to multiple data sets which are disaggregated by gender. In conjunction with the Ministry of Agriculture, they produce the Tanzania-

Agriculture Sample Census Survey, the most recent of which was conducted in 2007-2008 and includes data specifically on gender and poverty issues.

Because of differing timelines for Women's Empowerment in Agriculture Index (WEAI) data collection efforts, Tanzania was not included in the initial International Food Policy Research Institute (IFPRI)/USAID Feed the Future baseline report. The Sustainable Intensification of Maize and Legume Systems for Food Security in Eastern and Southern Africa (SIMLESA) Program and SUA completed the Adoption Pathways survey in 2013, which includes eight of the ten indicators of the WEAI. Komatsu provides analysis of these indicators in an IFPRI report. This report finds the largest constraint on Tanzanian women's empowerment to be lack of access to credit and decision-making power on credit (Komatsu 2015).

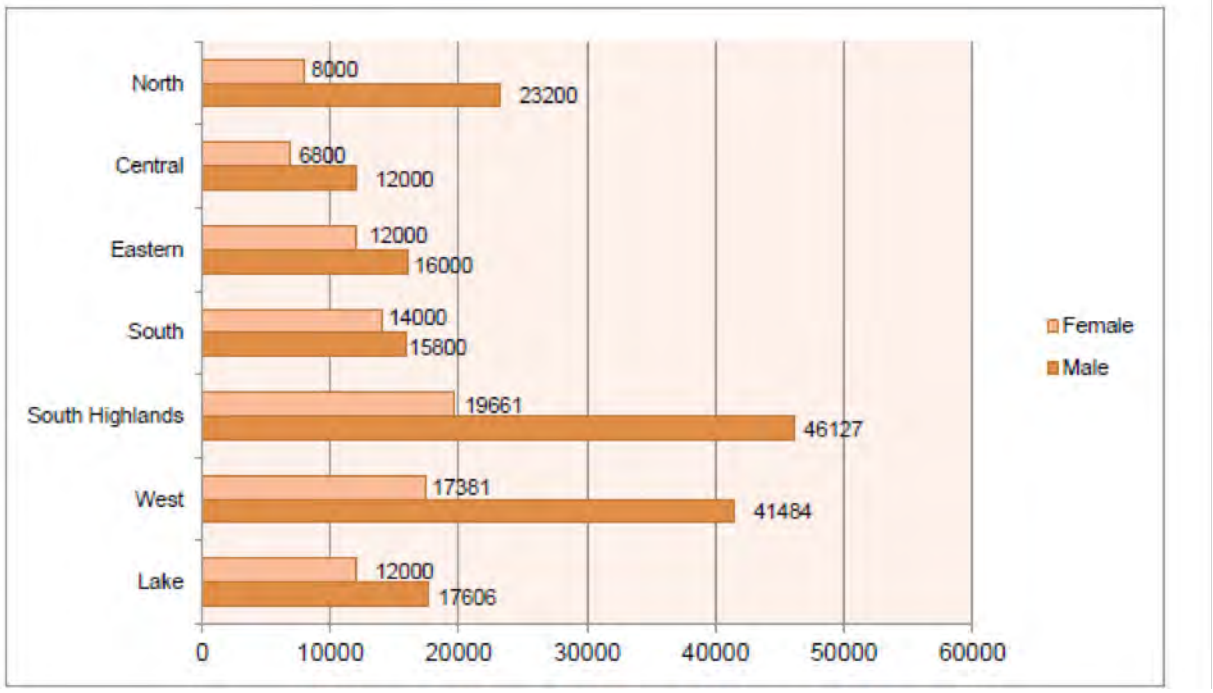
The FAO has published a comprehensive overview of gender inequalities in Tanzania's agricultural sector. Drawing on the National Panel Survey (NPS) 2009, the FAO Rural Income Generating Activities (RIGA) 2009 database, and the Integrated Labour Force Survey (ILFS) 2006, they have produced a country profile for mainland Tanzania of gender in rural employment (primarily agriculture) (FAO 2014). This document concludes that particular attention must be paid to improving women's land rights and access, formalization of on- and off-farm agricultural jobs, application of decent work principles, integration of women into the commercial cash crop systems and value chains, promotion of sustained rural skills development for youth through formal education (particularly for women), and tackling women's time poverty associated with domestic activities.

The Ministry of Education and Vocational Training provides comprehensive data on gender and educational achievement. The most recent publication is the Education for All (EFA) Report for Tanzania Mainland, 2015 which provides an overview of Tanzania's progress towards the Education for All goals and targets. From this data it is important to note that while primary school enrollments in Tanzania are very close to achieving full gender parity, the gender gap widens as the educational level increases.

5.4.2 Gender perspective on Tanzanian youth in the agrifood system

As mentioned earlier, youth are overall more likely to find themselves in vulnerable types of employment than adults over age 25. The majority of youth, especially rural youth, are involved in farming activities on their families' farms and are also very likely to engage in non-paid employment (FAO 2014). Young women are even less likely than young men to be paid employees and they are more likely to be concentrated in low-earning activities or seasonal employment (FAO 2014).

Figure 5.1 Average weekly earnings of rural, self-employed (median) males and females by (Tanzania Mainland) regions (Tanzania Shillings)



Source: FAO 2014

Moreover, the gender gap exists in both wage employment and self-employment. Female-owned businesses tend to be smaller and less productive (see Figure 5.1). This is likely due to the difference in available time for conducting business because of non-paid household responsibilities and lack of access to networks, credit, and input resources. An additional constraint is that female entrepreneurs often transition into business ownership from unpaid family work as opposed to their male counterparts who are likely entering their entrepreneurial endeavor from wage employment. The transition is therefore more difficult for women than for men, thus partially explaining lower profits and slower growing businesses (FAO 2014). In the interviews conducted with local and international implementers, several programs targeted women to improve access to finance and land. The Government of Tanzania has empowerment funds set up to address some of these issues by supporting women and youth, but these are poorly coordinated with little oversight (IDRC).

In examining the WEAI indicators in five Tanzanian districts, Komatsu (2015) pinpoints the areas where women are particularly disempowered. The author found that women are less likely than men to have adequate achievements in every area (production decision-making, control over use of income, time, and leadership) except for group membership and access to credit in Tanzania. Access to credit is the largest constraint to empowerment for both women and men with 91% of women and 94% of men lacking access to, and decision-making power on, credit. According to this data, the second largest constraint to empowerment for women was the reluctance to speak in public, while for men, it is the lack of membership in groups. The data from this study, however, only examined men and women as gender categories and did not present age-related data or use age as an analytical category.

The expansion of horticultural and small livestock value chains have provided women new opportunities because these are areas not traditionally dominated by men.

The expansion of horticultural and small livestock value chains have provided women new opportunities because these are areas not traditionally dominated by men. Women are taking advantage of new opportunities in post-farm processing, although some of the current jobs available in this area are seasonal or low wage and high risk employment. All of these areas—post-farm processing, horticulture, small livestock—are consistent with the recommendations of Chapter 3.

5.4.3 Gaps and Recommendations

As in Rwanda, the challenge with available data sources is that a majority of published data analyses consider gender and youth as dichotomous categories (men/women or youth/adult) and do not cross-reference the two. This can obscure understandings of social dynamics and challenges that specifically face young women by grouping them in an overarching gender category or including them in a youth category with their male peers. Multivariate analysis that includes breakdown of urban/rural by youth and gender are also lacking. This is true in both Tanzania and in Rwanda (and in continent wide studies as well). FAO's mainland Tanzania gender inequalities overview is an exception and includes consideration of all three factors in its analysis.

Horticulture is the fastest growing agricultural sub-sector in Tanzania, worth USD 45 million per year and providing direct employment to more than 10,000 people (CARE 2013). There are emerging opportunities for women in this sector. However, horticultural value chain development needs to take into account gender dynamics in order for these opportunities to have an impact on closing the gender gap in agriculture. A study of the onion value chain in northern Tanzania (Jeckoniah, Mdoe, & Nombo 2013) revealed:

- Women do not equally benefit from growth in the value chains of high value and export crops.
- Women face constraints in marketing because of travel limitations placed on them by their husbands or male partners.
- Women's participation in horticultural value chains has increased, but their activities are concentrated in the lower part of the value chain—specifically in production.
- The traditional divide between men's and women's activities in horticulture production is becoming blurred; some activities that used to be done only by men are now also carried out by women; however, these role changes often mean that women must add labor to their already existing household chores, increasing their workload.

To address these challenges, researchers and practictioners recommend that government, NGO, and private value chain interventions should:

- Engage communities to address and mitigate unfavorable gender norms (restriction of movement and appropriation of women's incomes) that reduce women's participation in marketing and post-production segments of the value chains.
- Facilitate the formation of women's cooperatives and associations, engage existing cooperatives or groups, and support women's participation in collective action groups (cooperatives, Savings and Credit Cooperative Society [SACCOS], and informal groups) involved in horticultural production and marketing. A 2012 study carried out in Lushoto on women's collective action in the vegetable sector found that women members in the groups surveyed (both women-centered and mixed gender) earned 68% more than corresponding non-members (Oxfam 2013). Where mixed groups exist, issues of women's leadership and empowerment within the group should be addressed to increase gender equitable access to financial services, input, and social support.
- Improve coordination of external support from NGO, government, and donor actors and develop a coherent policy framework to support women's participation in collective action groups. Many initiatives have supported different models of group formation which causes competing demands on the group members (Oxfam 2013).
- Formalize on-farm and off-farm agrifood system jobs and find ways to ensure that women and their households are protected from unforeseen shocks like crop loss, drought, etc. (FAO 2014).
- Take into account women's roles and time allocations for domestic and productive labor when designing interventions.

5.5 MAPPING OF NON-GOVERNMENTAL STAKEHOLDERS

This section will look at that relationships and interactions among non-governmental actors which play a role in impacting youth in the agrifood sector, such as NGOs, commodity associations, private sector companies, and other civil society organizations, and between these groups and the Government of Tanzania.

The in-country stakeholder interviews revealed that while non-governmental actors in this sector are sharing information in an ad hoc way, there is currently no systematic platform to communicate, share best practices, and avoid duplication of efforts. As several new employment of youth (EOY) initiatives are being launched in Tanzania, the need for systematic coordination efforts is likely to grow. Several non-governmental stakeholders asserted that they would benefit from a coordinating entity or forum which could improve their programs' effectiveness and maximize the number of Tanzanian youth reached.

The private sector has a significant role to play in initiatives and programs related to expanding economic opportunities for youth in the agrifood sector. Currently, the private sector contributes sporadically to curriculum development and training for Tanzania's vocational and technical training system. Companies and individuals also collaborate on an ad hoc basis with implementing NGOs, the VETA and university systems, and other civil society organizations to provide occasional youth internship and mentorship opportunities. Private sector leaders also serve on the boards of commodity associations and other non-governmental organizations and help shape programming for youth initiatives.

5.5.1 International NGOs/Firms

International NGOs and firms such as Technoserve, SNV, and DAI implement youth programs in the agrifood sector supported by various international donors and in cooperation with the Government of Tanzania. The programs primarily focus on entrepreneurship and developing business and soft skills because formal employment opportunities are few and because employers themselves are taking on the training responsibilities for their own employers. NGOs have seen the entrepreneurship space as the area where they can make the most impact. The programs that were included in this scoping study have an explicit focus on the agrifood sector although several of them are also implementing programs in other sectors (e.g., energy and general youth entrepreneurship). The International Labor Organization is one of the organizations that has worked most closely with the Government of Tanzania—specifically the Ministry of Labor and the Prime Minister's office—to implement EOY initiatives, although several others are coordinating with various government agencies and local governments to carry out their programs.

All of the international organizations that were interviewed have relationships with the private sector, primarily for internship and mentorship

opportunities, input into training programs, and access to new technology. DAI, through the USAID-funded Africa LEAD II program, is working across organizations and sectors to build leadership and institutional capacity among stakeholders in the agriculture sector. The scoping study revealed evidence of Africa LEAD program impact in several local organizations. Finally, the Eastern African Grain Council's Institute, a regional commodity association, has initiated training programs to improve technical skills in particular value chains.

5.5.2 Local NGOs, firms, and civil society organization

Local firms and organizations are a growing presence in youth economic initiatives in Tanzania. This includes professional and commodity associations, NGOs, and cooperatives, and other civil society organizations. Several local organizations are working closely with SUA and MATIs as well as VETA to gain access to facilities, instructors, and technical expertise that feed into technical training and skills building programs. The Tanzanian Horticultural Association, for instance, utilizes facilities and staff from the Tengeru Horticultural Research and Training Institute (a MATI) to deliver farmer field day trainings.

Many local organizations also work in close collaboration with government entities on entrepreneurship initiatives. For example, the Sokoine University Graduate Entrepreneurs' Cooperative (SUGECO) has partnered with the Small Industries Development Organization (a parastatal organization) to gain access to training opportunities and small loans programs. The Tanzanian Entrepreneurship and Competitiveness Centre works closely with the National Economic Empowerment Council (now under the Prime Minister's Office) to implement the Kijana Jiajira program.

5.6 SUMMARY

Tanzania has achieved impressive economic growth over the past 20 years. Following reforms that steered the country's economy away from a state-led strategy to market liberalization, real GDP growth rose from 3.3% in the early 1990s to an average of seven percent through the late 1990s and 2000s. Tanzania's economic growth has concentrated mainly in urban areas and is driven by capital-intensive sectors, including mining, telecommunications, construction and banking. Except for construction, all of these capital-intensive sectors create few jobs directly. The Tanzanian agrifood system's rate of growth has been consistently lower than other sectors, leading to a slower decline in poverty in rural areas, rising inequality between urban and rural populations, and hastening rural-to-urban migration.

Tanzania faces the dual challenge of achieving faster growth while accelerating the shift of its labor force, especially youth, to more productive work. Tanzania is well-endowed with natural resources and has significant potential to expand agricultural land, as well as intensify agriculture on-farm and through the development of value chains. With the recent discovery of large natural gas reserves, together with the expanding mining industry, there will also be opportunities to create jobs and businesses to service the needs of these growing communities.

The country has a strong set of agriculture sector policies and programs, but there has been relatively little focused attention on youth employment up to now in national policies and programs. The Government of Tanzania currently does not have a comprehensive coordinated policy on youth skills and employment or an overall employment or youth goal. Where national policies exist, they lack strong implementation and monitoring plans, so impact is uncertain. Programs related to youth are being undertaken by different ministries and NGOs, but they are not well coordinated. The very recent consolidation of youth programs under the Prime Minister's office is a promising step in the right direction. Access to land and finance are major constraints for youth opportunities in the agrifood system.

This review points to issues and gaps that must be addressed to elevate youth engagement in the evolving agrifood system as an urgent policy priority in Tanzania. First, the lack of interest by youth in agriculture and its perception as a last-resort activity is a challenge. Agriculture is not perceived as a potentially lucrative business activity that involves a spectrum of new on-farm and off-farm businesses connected to marketing, processing, packaging, and food service at all stages of the agrifood system.

Second, education levels, while improving, are low and there is a significant gap between the skills demanded by the private sector and those supplied by formal and informal education and training programs, including specialized technical skills, entrepreneurial/business skills, and soft skills. Primary school is the highest level of education attained by most Tanzanian youth. Technical Vocational Education and Training (TVET) systems are designed to offer practical instruction and experience, but relatively few TVET institutions in Tanzania offer agrifood system courses, nor are they targeting unemployed and underemployed youth. The Ministry of Agricultural Technical Institutes in Tanzania (MATIs) do provide agricultural courses, but have limited capacity to meet student demand in the most popular areas, e.g., horticulture. In general, there is need for a much greater level, and more systematic, private sector engagement in developing appropriate curriculum and providing opportunities for students to get meaningful practical experience and training.

Third, it remains very difficult to reach out-of-school, rural youth via informal training, and to expand the availability of informal training courses that are linked to institutionalized TVET and tertiary systems. To reach out of work and underemployed youth, innovative, non-traditional recruitment strategies are essential. Given the weakness of the agricultural extension service, the ongoing provision of technical content through informal channels, including primary and secondary schools, associations, agribusiness dealers, and social media is important to keep youth updated on agricultural innovations and opportunities.

Fourth, the experience of Asian countries which have developed into middle-income countries through agricultural development has shown that progressive value addition and SME development is a critical lever for connecting skills development and access to financial resources with economic opportunities that lead to expanded youth employment. In Tanzania, expanded SME programs directed at youth could be linked to the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), as part of its demand-driven cluster development. Currently these programs lack an explicit focus on out of work or underemployed youth.

Fifth, the experiences of SME and cluster programs in Tanzania also illustrate the steep learning curve youth entrepreneurs face in starting businesses and responding to market demands. The reluctance of financial institutions to lend to young agricultural entrepreneurs and high rates of startup failure suggest the importance of providing a longer-term "safe" incubator environment where young people can learn and practice essential technical and business skills as they are mentored, avoiding early catastrophic failure. Incubators can also facilitate access to resources and skills needed by youth to modernize and intensify on-farm production systems, including for coffee and tea, which may be too risky to attempt on their own.

Sixth, youth entrepreneurs engaged in small and medium enterprises (SMEs) and clusters of agrifood system-related businesses and services require assistance to analyze market potential for their products, and to identify and address priority policy and regulatory issues that affect value chain development. Youth also need to be able to access specialized training and assistance to address emerging downstream agrifood business challenges, including meeting local and international food safety standards and developing appropriate, low-cost packaging.

Finally, although youth and women constitute the rural majority in Tanzania, few existing analyses examine factors affecting the development of specific value chains using youth as well as gender lenses. Census data and other household and business establishment data could be used to track the development of specific priority value chains and their contribution to agricultural, economic, and workforce development goals, and determine what program interventions are most effective in improving the participation and success rate of target youth groups.

CHAPTER 6:

CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY FINDINGS AND CONCLUSIONS

6.1.1 Strategic Policy and Foresighting Analysis

The AgYees Strategic Policy and Foresighting Analysis reviewed youth employment in Africa from two perspectives. Chapter 2 offered a detailed description of employment trends in the region, with a particular focus on men and women between 15 and 35 years of age, and examined the role of agricultural productivity growth (and the various land and agricultural policies that influence it) in promoting job growth in the overall economy. Chapter 3 took a complementary approach, examining the structure of consumer demand for food, projecting how it is likely to change over the next five years, and linking these consumption changes to changes in future employment. Taken together, the two chapters provide new insights regarding unfolding employment dynamics in Africa, with a special focus on Nigeria, Rwanda, and Tanzania.

Several common findings emerge from the two chapters. First, both agree that African economies have been transforming significantly over the past 15 years, with generally rapid but highly variable rates of exit of labor from farming into off-farm segments of the economy. Second, despite using different data[1], the two chapters coincide in suggesting that rate of exit from farming has been most rapid in Rwanda, followed by Tanzania, and that Nigeria has shown slow or no exit. The shift of labor out of farming is consistent with the broader literature in two respects: results on Nigeria are consistent with findings by Tschirley et al. (2015), McMillan and Harttgen (2014) and many others on the negative effects of natural resource booms in Africa on economic transformation; and the findings on the ordering of the three countries in terms of rates of exit from farming are consistent with those obtained by McMillan and Harttgen (2014) using entirely different data and methods.

Third, when computed as full-time equivalents (FTE), we find that farming (of own farms plus hired farm labor) accounts for 43% to 48% of the labor force in Tanzania, about 53% in Rwanda, and 34% in Nigeria.[2] When employment is based on a count of total jobs (as opposed to FTE), farming's share rises to 67% in Rwanda, 59% in Tanzania, and 42% in Nigeria. The proportion of the labor force in the off-farm segments of the agrifood system is about eight percent in Rwanda, 17% in Tanzania, and 23% in Nigeria in FTE terms. Other off-farm sectors, mainly commerce and transport, construction and the public sector, employ roughly 37% in Rwanda, 35% in Tanzania, and 43% in Nigeria in FTE terms.

Fourth, in terms of new job creation, the chapters both show that employment in the off-farm portion of the agrifood system is growing much more rapidly in percentage terms than employment in farming, but that the growth is from a lower base, and thus the contribution to new jobs in off-farm employment is smaller than that of farming.

Fifth, both chapters find that the potential role of the off-farm agrifood system in new employment varies greatly across countries. The off-farm agrifood system will contribute between 18% and 22% of all new FTE jobs in Tanzania over the next five years. This figure is not much lower than farming's 31% to 34% contribution. The off-farm agrifood system currently accounts for 22% to 24% of jobs in Nigeria but only 18% of FTE job growth (half that of farming) due to the lack of exit from farming in that country. On the other hand, the off-farm agrifood system

1 Chapter 2 computes its results directly from the most recent nationally representative household-level LSMS surveys in each country, while Chapter 3 uses data from GGDC.

2 Chapter 3 includes hired farm labor in its calculations and therefore reports slightly higher numbers in farming in each country: 35% in Nigeria, 43% in Tanzania, and 54% in Rwanda.

accounts for only 8% of jobs and 11% of job growth (about one-third that of farming) in Rwanda.

The analysis in the two chapters differs on the relative importance of farming in new job creation. Chapter 2 finds that farming has accounted for the largest number of new jobs (compared to the off-farm agrifood system and the rest of the economy outside the agrifood system) in the time period between the two most recent nationally representative surveys in each country. Specifically, based on nationally representative survey data over the two most recently available survey years, Chapter 2 shows that farming contributed 59%, 52%, and 33% of all new jobs created in the economies of Nigeria, Tanzania and Rwanda, respectively. The off-farm agrifood system contributed 40%, 16%, and 11% of all new jobs in the three countries, respectively. The off-farm sector outside the agrifood system accounted for 1%, 32% and 57% of all new jobs in Nigeria, Tanzania and Rwanda, respectively. Both analyses show farming's share of new jobs to be highest in Nigeria and lowest in Rwanda. Chapter 3, however, suggests farming will provide only about one-quarter to one-third of new jobs in the countries, while Chapter 2 suggests a range of one-third to nearly 60%.

Overall, the two chapters tell a consistent story about the major dynamics underway in African employment: labor is moving sharply out of farming as the economies transform, yet farming remains extremely important for livelihoods and economic growth in all these countries. Moreover, the off-farm agrifood system is growing very rapidly in percentage terms and will offer important opportunities for new businesses, but it will not match farming in the absolute level of new job creation for at least ten years.

Because the two chapters take different approaches to similar questions, each also generates unique insights. An outstanding result from Chapter 2 relates to the importance of agricultural productivity growth to the rate and structure of employment growth off-farm. In concert with historical economic transformation processes in Asia, the chapter demonstrates that the pace of economic transformation from farming to off-farm employment is directly related to agricultural productivity growth. Rwanda, having experienced the highest agricultural productivity growth, also has experienced the most rapid decline in the share of the labor force engaged in farming. In contrast,

slow agricultural productivity growth in Nigeria has been associated with very little change in farming's share of the labor force. The literature suggests that agricultural productivity growth, especially if broadly based, will generate strong multiplier effects that expand job opportunities in the downstream stages of the agrifood system as well as in the broader off-farm economy. Hence, a major entry point to enhance employment growth in the three countries is to advocate for programs and policies that improve agricultural productivity growth. Such efforts targeted at increasing productivity, especially in farming, will potentially yield broad-based and inclusive growth with greater multiplier effects on off-farm job creation in all the three countries given the relatively large number of people currently engaged in farming.

Furthermore, a key constraint to promoting labor productivity growth in farming is access to land, especially in land-scarce regions like Rwanda. Population pressures, increases in world food prices, and associated rising interest in Africa's arable land drive up land prices in the region, limiting the ability of youth, in particular, to access land. Advocating for judicious land tenure and land allocation policies will therefore be crucial in such areas in order for farming to be attractive and profitable for the youth, and more importantly, for farming to generate strong growth multipliers that rapidly expand the number of jobs being created in the off-farm segments of the economy.

Several results from Chapter 3 are especially relevant for The MasterCard Foundation programming. First, food away from home (FAFH) should generate high quality jobs for youth in all three countries, even if the absolute number of jobs they will support will not be as large as in other sectors. Because the food away from home sectors are much larger in Nigeria and Tanzania than in Rwanda, the former two may present opportunities to focus activities and programming in this sector. This rationale is further supported by the fact that FAFH in these two countries not only offers the most rapid and largest growth in demand of any type of food, but also offers the most rapid growth in output per worker in each country; wages in these sectors (or returns to labor in own employment) are thus likely to be attractive and rapidly improving.

Second, food manufacturing in Tanzania offers the highest output per worker, the second-highest rate of growth in output per worker, and fairly large employment absorption, at 5% of all new jobs. In this respect, food manufacturing becomes a potentially attractive area of focus for national and regional stakeholders and The MasterCard Foundation in Tanzania. In all three countries, results suggest that food manufacturing should offer high quality jobs, but with a much larger number of jobs in Tanzania than in Rwanda and Nigeria.

Third, fresh produce (fruit and vegetables) and dairy offer strong growth prospects for young farmers in Rwanda, from a double perspective: for each, local demand is growing rapidly and export possibilities are strong. Fresh produce could be exported regionally and, if proper investments are made and sustained, internationally to high-income markets. The dairy market in East Africa is already strongly regional and growing rapidly, and Rwanda could be poised to benefit greatly from satisfying some of the growing demand among its much larger neighbors.

Fourth, FAFH stands to benefit women in Nigeria and Tanzania especially, where 90% and 71%, respectively, of all FTE employment in the sector is female.

Fifth, the 25-34 year age group is significantly less likely to be engaged in farming than is the 15-24 year in each country (Table 3.19). This pattern suggests that youth may start in farming due to lack of other alternatives, but then look to leave it when they find better options. In light of this and other findings in this paper, the national and regional stakeholders and The MasterCard Foundation might consider pursuing mixed strategies that (a) increase the knowledge, productivity, and market engagement of those youth who have the predilection and ability to be good farmers, and (b) provide training and other assistance to increase the profitability of off-farm activities for the many youth who will end up leaving the sector.

6.1.2 Landscape Analysis

The AgYees Landscape Analysis reviewed the economic, policy, and program landscape affecting current efforts to expand productive jobs for unemployed and underemployed youth in the agrifood sectors of Rwanda and Tanzania. In both countries, youth dominate the general population and labor force. Most still live in rural areas and work on small family farms, but youth unemployment and underemployment in both urban and rural areas is a rising issue.

During the 2000s, Rwanda's economic and agricultural policies contributed to strong GDP growth averaging eight percent between 2001 and 2014, accompanied by a twenty-point reduction in poverty. Consistent with Chapter 2 findings on the impact of agricultural productivity growth on inclusive economic growth, Rwanda's economic and poverty reduction success story in the early 2000s was in large part due to significant improvements in on-farm agricultural productivity which lifted the incomes of rural families. Now, Rwanda's severe land constraint limits further agricultural area expansion and especially youth access to land. A new strategy is required to foster continued economic growth that effectively engages young people and creates not only more, but more productive, poverty-reducing jobs for youth, both on and off the farm.

Tanzania has also achieved impressive economic growth over the past 20 years. Following reforms which steered the country's economy away from a state-led strategy to market liberalization, real GDP growth rose from 3.3% in the early 1990s to an average of seven percent through the late 1990s and 2000s. Unlike Rwanda, Tanzania's economic growth has concentrated mainly in urban areas and is driven by capital-intensive sectors, including mining, telecommunications, construction and banking. Except for construction, all of these capital-intensive sectors create few jobs directly. Also different from Rwanda, the Tanzanian agrifood system's rate of growth has been consistently lower than other sectors, leading to a slower decline in

poverty in rural areas, rising inequality between urban and rural populations, and accelerating rural-to-urban migration.

Tanzania faces the dual challenge of achieving faster growth while accelerating the shift of its labor force, especially youth, to more productive work. In contrast to Rwanda, Tanzania is well-endowed with natural resources and has significant potential to expand agricultural land, as well as intensify agriculture on-farm and through the development of value chains. With the recent discovery of large natural gas reserves, together with the expanding mining industry, there will also be opportunities to create jobs and businesses to service the needs of these growing communities.

Rwanda is attempting to address its youth and productive employment challenge by setting a target of 200,000 new off-farm jobs annually and taking steps to improve the coordination of related employment, skills and finance programs, many with an explicit focus on youth employment. In Tanzania there has been relatively little focused attention on youth employment until recently in national policies and programs. The Government of Tanzania currently does not have a comprehensive coordinated policy on youth skills and employment or an overall employment or youth goal. Where national policies exist, they lack strong implementation and monitoring plans, so impact is uncertain. Programs related to youth are being undertaken by different ministries and NGOs, but they are not well coordinated. In both Rwanda and Tanzania, access to land and finance are major constraints for youth opportunities in the agrifood system.

To reach out of work and underemployed youth, non-traditional recruitment strategies are essential.

This review points to issues and gaps that must be addressed to elevate youth engagement in the evolving agrifood system as an urgent policy priority in Tanzania and to expand the scale and effectiveness of youth employment and skills training programs in both countries.

First, in both countries, agriculture is widely perceived by youth to be a traditional, hand-hoe, low-profit and generally unappealing activity. Agriculture is not seen by youth as a potentially high-profit, short-turnaround business activity that involves the spectrum of new on-farm and off-farm businesses connected to marketing, processing, packaging, and food service at all stages of the agrifood system. In Rwanda, the policy goal of 200,000 off-farm jobs annually is often interpreted as "non-agricultural jobs" by government representatives and program implementers, even in rural areas, potentially neglecting opportunities to create productive employment for youth with strong growth and poverty implications. For example, Rwanda is an African leader in the application of ICT and other advanced technologies, which are appealing to youth. However, ICT applications for the agrifood system which could increase productivity or provide access to finance or market information are not strongly promoted.

Second, although education levels in both countries are improving, they are still low by global standards, and there is a significant gap between the skills demanded by the private sector and those supplied by formal programs and informal education and training programs, including specialized technical skills, entrepreneurial/business skills, and soft skills. Primary school is the highest level of education attained by most youth in Rwanda and Tanzania. Technical Vocational Education and Training (TVET) systems are designed to offer practical instruction and experience, but relatively few TVET institutions in either Rwanda or Tanzania offer agricultural courses, nor are they targeting unemployed and underemployed youth. The Ministry of Agricultural Technical Institutes in Tanzania (MATIs) do provide agricultural courses, but have limited capacity to meet student demand in the most popular areas, e.g., horticulture. In general, there is need for a much greater level, and more systematic, private sector engagement in developing appropriate curriculum and providing opportunities for youth to get meaningful practical experience and training.

Challenges also remain in reaching out-of-school, rural youth via informal training, especially expanding the availability of informal training courses that are linked to institutionalized TVET and tertiary systems and are potentially more sustainable, or which carry the future possibility of qualifying as stackable courses that can help youth earn certifications. To reach out of work and underemployed youth, non-traditional recruitment strategies are essential. Given the weakness of the agricultural extension service in both countries, the

ongoing provision of technical content through informal channels, including primary and secondary schools, associations, agribusiness dealers, and social media is important to keep youth updated on agricultural innovations and opportunities.

Third, SME development is a critical lever for connecting skills development and access to financial resources with real economic opportunities that lead to expanded youth employment, in line with agrifood sector comparative and competitive advantage in both countries. The focus on SME development in the agrifood system is consistent with past efforts of Asian countries, including Thailand and Vietnam, which harnessed the process of structural transformation to facilitate more broad-based economic growth and higher quality, more productive jobs throughout priority agricultural value chains. Two innovative programs introduced by Rwanda's MINICOM—the Hanga Umuriumo Program (HUP) and Community Processing Centers (CPCs) and sector cluster development—are promising in their efforts to better coordinate SME-related training programs provided through different ministries and levels of government, and to link training with access to finance, equipment and other resources. The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) is also facilitating demand-driven cluster development, but so far without an explicit focus on out of work or underemployed youth. In Tanzania, links to appropriate institutionalized skills training, finance, and land access need to be strengthened.

The experiences of SME and cluster programs in both countries also illustrate the steep learning curve youth entrepreneurs face in starting businesses and responding to market demands on an ongoing basis. The reluctance of financial institutions to lend to young agricultural entrepreneurs and high rates of startup failure suggest the importance of providing a longer-term "safe" incubator environment where young people can learn and practice essential technical and business skills as they are mentored, avoiding early catastrophic failure. Incubators can also facilitate access to resources and skills needed by youth to modernize and intensify on-farm production systems, including for coffee and tea, which may be too risky to attempt on their own.

Fourth, youth entrepreneurs engaged in small and medium enterprises (SMEs) and clusters of agrifood system-related businesses and services require assistance to analyze market potential for their products, and to identify and address priority policy and regulatory issues that affect value chain development. Youth also need to be able to access specialized training and assistance to address emerging downstream agrifood business challenges, including meeting local and international food safety standards and developing appropriate, low-cost packaging.

Fifth, although youth and women constitute the rural majority in both countries, few existing analyses examine factors affecting the development of specific value chains using youth as well as gender lenses. Census data and other household and business establishment data could be used to track the development of specific priority value chains and their contribution to agricultural, economic, and workforce development goals, and determine what program interventions are most effective in improving the participation and success rate of target youth groups.

6.2 RECOMMENDATIONS

Based on the results of this study, the AgYees team offers the following recommendations for youth-related programming in Rwanda, Tanzania and Nigeria.

	AgYees Recommendations
R1:	**Support action-oriented research and knowledge on strategies and policies that will raise agricultural productivity growth and economic returns to labor in farming, including land tenure and land allocation policies:** Increasing agricultural productivity has the potential to yield broad-based and inclusive growth with significant multiplier effects on off-farm job creation, given historical experience from Asia and the large absolute numbers of jobs that will be created by farming in Nigeria, Tanzania and Rwanda for at least the next decade.
R2:	**Pursue a mixed program strategy to increase youth economic opportunities both on and off-farm:** These programs should (a) increase the knowledge, productivity, and market engagement of youth who have the desire and ability to be good farmers, and (b) provide training and other assistance to increase the profitability of non-farming activities for the many youth who will end up leaving the sector.
R3:	**Focus programming especially on value chains that service the expanding food away from home, food manufacturing, and horticulture sectors:** In Nigeria and Tanzania, farm service provision, on farm production, supply, marketing, processing, wholesaling and retailing of fruits and vegetables, poultry, fish, dairy and high-demand cereals and oilseeds are expected to generate high quality jobs for youth and women. In Rwanda, fresh produce and dairy offer strong growth prospects for young farmers to serve both domestic and regional markets.
R4:	**Develop and implement comprehensive youth employment strategies:** Provide technical assistance and financial resources to enable government to develop (in the case of Tanzania) and fully implement (in both countries) a comprehensive youth employment strategy and implementation plan, with programs coordinated across ministries and levels of government. The programs should include appropriate metrics and monitoring systems. Work with other donors to ensure coordinated funding to implement the strategy.
R5:	**Work to change youth mindsets about agrifood system-related opportunities:** Raise youth awareness about profitable agrifood sector opportunities through multi-media campaigns showcasing agri-entrepreneur role models, new technologies, and exploring business opportunities for youth.
R6:	**Accelerate the application of ICT and other advanced technologies to agrifood system problems:** Ensure that curriculum and informal training courses, including those focused on out-of-school youth, reflect up-to-date technologies. Do this through programs that facilitate collaboration between top universities and polytechnics with private sector associations and other partners to develop, adapt, and disseminate problem-solving innovations. Expand out-of-school rural youth access to technology and engagement through rural Technology Innovation Labs and Service Centers similar to KLab (Kigali).
R7:	**Expand agrifood system training programs and improve curricula:** A persistent low educational and skill level will adversely impact future labor productivity growth and the economic transformation process. In Tanzania, prioritize the expansion of agrifood system training programs in the TVET system and MATIs, targeted especially to out-of-work, underemployed youth. In Rwanda, draw on Rwanda Development Board recommendations on agricultural sector skills needs, accelerate the adoption of competency-based curriculum revisions in support of five agrifood system-related trades with certifications, and expand curriculum revisions to additional agrifood trades.
R8:	**Increase private sector engagement in training programs:** Provide guidelines and resources to educational institutions and non-formal training providers to facilitate regular private sector input to their programs, to review and shape curricula, assist with internship, apprentice and incubator programs, and provide private sector professionals to teach classes and provide content for multi-media programs, focusing especially on out-of-school youth.

	AgYees Recommendations (cont.)
R9:	**Integrate more and higher quality experiential learning in a cost-effective way:** Develop, test, and monitor alternative methods of integrating experiential learning and extended mentoring into skills training and through SME incubators to learn what methods work best to help youth apply learned skills to real employment and entrepreneurship in the agrifood system. Expand the SME cluster incubator concept on farm in high-value agrifood systems, and monitor the outcomes. Work with government, local communities and the private sector to dedicate underutilized land for youth working in groups on intensive, high-potential agriculture enterprises. Work with private sector associations to provide young entrepreneurs and employees with ongoing mentoring and help with solving problems as they arise.
R10:	**Institutionalize monitoring, learning and communication:** Invest in country monitoring and evaluation capacity to continuously learn from program elements that affect learning effectiveness, youth employment, and SME development success. In both countries it will be important to develop appropriate monitoring and evaluation strategies to discern which approaches are more successful than others in transferring experience from the classroom to the real world, which factors affect loan repayment and business success, and why. Develop a common platform for communication and information sharing among youth employment programs.
R11:	**Ensure that SME clusters can access up-to-date training, technologies, and market information, and identify and implement options for addressing policy/regulatory issues:** Provide resources for SME clusters to commission analyses and implement recommendations related to markets and options for addressing policy and regulatory barriers. Ensure that youth can access specialized training and assistance on an on-demand basis to address new downstream business challenges and opportunities, including meeting food safety standards and developing appropriate, low-cost packaging. Ensure access by micro- and small firms in the post-farm segment of the agrifood system to finance, technology, and training.
R12:	**Mainstream gender and youth in all programmatic interventions:** Use data from programs, census and other household and business establishment surveys to track the development of specific priority value chains, their contributions to workforce development and equity as well as economic goals, and determine what program interventions are most effective in improving the participation and success rate of target groups.

ANNEXES

ANNEX 1:
LIST OF ACRONYMS AND TERMS

ACRONYMS

AFS	Agrifood system
ASDP	Agricultural Sector Development Programme, Tanzania
ASDS	Agricultural Sector Development Strategy
BRN	Big Results Now!, Tanzania
CAADP	Comprehensive Africa Agriculture Development Programme
CIF	Cost, Insurance, and Freight
CIMMYT	International Maize and Wheat Improvement Center
COMPETE	USAID Competitiveness and Trade Expansion, Tanzania
CPC	Community Processing Center
EDPRS	Economic Development and Poverty Reduction Strategy, Rwanda
EICV	Integrated Household Living Conditions Survey
FAFH	Food away from home
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistics Division
FTE	Full-time equivalent
GDP	Gross Domestic Product
GGDC	Groningen Growth and Development Center
GIF	Growth Identification Framework
GIZ	German Society for International Cooperation
GOR	Government of Rwanda
GOT	Government of Tanzania
HUP	Hanga Umurimo Program
iAGRI	USAID Innovative Agricultural Research Initiative
ICT	Information and Communications Technology
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
ILFS	Integrated Labor Force Survey
ILO	International Labor Organization
IMF	International Monetary Fund
IPRC	Integrated Polytechnical Regional Center
ISIC	International Standard for Industrial Classification
IYF	International Youth Foundation
LMIS	Rwanda Labour Market Information Survey
LSMS	Living Standards Measurement Surveys
LSMS-ISA	LSMS-Integrated Surveys of Agriculture
MAFC	Ministry of Agriculture, Food Security, and Cooperatives, Tanzania
MATI	Ministry of Agriculture Training Institute, Tanzania
MDG	Millennium Development Goals
MIFOTRA	Ministry of Public Service and Labor, Rwanda
MINAGRI	Ministry of Agriculture and Animal Resources, Rwanda
MINEDUC	Ministry of Education, Rwanda
MINICOM	Ministry of Trade and Industry, Rwanda
MKUKUTA	National Strategy for Growth and Reduction of Poverty, Tanzania
MSU	Michigan State University
NACTE	National Council for Technical Education, Tanzania

NEP	National Employment Programme, Rwanda
NISR	National Institute of Statistics Rwanda
NPS	National Panel Survey
PMO-RALG	President's Office Regional Administration and Local Governance, Tanzania
PPP	Purchasing Power Parity
PSTA	Strategic Plan for the Transformation of Agriculture, Rwanda
PUMS	Integrated Public Use Microdata Series
SACCO	Savings and Credit Cooperative
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SIDO	Small Industries Development Organization, Tanzania
SME	Small and Medium Enterprises
SSA	Sub-Saharan Africa
STRYDE	Strengthening Rural Youth Development through Enterprise
SUA	Sokoine University of Agriculture
TAFSIP	Tanzania Agriculture and Food Security Investment Plan
TECC	Tanzania Entrepreneurship and Competitiveness Center (TECC)
TFP	Total Factor Productivity
TSS	Technical Secondary Schools
TVET	Technical Vocational Education and Training
UN	United Nations
USAID	United States Agency for International Development
VETA	Vocational Education and Training Authority, Tanzania
VTC	Vocational Training Centers
WEAI	Women's Empowerment in Agriculture Index

TERMS

Agrifood system	We define the agrifood system as the set of activities, processes people, and institutions involved in supplying a population with food and agricultural products. The agrifood system encompasses provision of farming inputs and services, production at farm level, post-farm marketing, processing, packaging, distribution, and retail, and the policy, regulatory, environmental, and broader economic environment in which these activities take place.
Downstream agrifood system	Activities in post-farm value addition, e.g., assembly trading, wholesaling, storage, processing, retailing, preparation of food for sale outside the home, beverage manufacturing, etc.
Farming	One major component of the agrifood system, including on-farm production of crops and livestock.
Off-farm outside the agrifood system	All economic activities not directly related to the production, processing, and distribution of food and agricultural products
Off-farm within the agrifood system	All upstream and downstream activities.
Value chain	The full lifecycle of a product or process, including material sourcing, production, consumption and disposal/recycling processes. (World Bank Council for Sustainable Development (2011).
Upstream agrifood system	Activities feeding into farm production such as input provision and agricultural services

ANNEX 2: REFERENCES

Chapter 1. Introduction

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ANNEX 3: METHODOLOGICAL DETAILS ON CLASSIFICATION OF EMPLOYMENT SECTORS

Classifications of individuals into employment sectors in Chapter 3 were based on survey respondents' stated industry of employment defined as the activity or product of the establishment or sector in which the person is employed. Each dataset provided information on respondents' industry of employment that had been coded following conventions established by International Standard for Industrial Classification (ISIC). The ISIC codes created by the United Nations Statistics Division offers an international reference classification module for all economic activities. The classification is subdivided into a hierarchical, four-level structure of mutually exclusive categories – section, division, group and class. Each level offers more detailed information of the activity being described. For instance, depending on the level of classification employed, a person engaged in maize production will be classified at the first to fourth levels as follows: 1. Agriculture, forestry and fishing, 2. Crop and animal production, hunting and related service activities 3. Growing of non- perennial crops 4. Growing of cereals, leguminous crops and oil seeds.[1] Similarly, a person engaged in meat processing will be classified as follows 1. Manufacturing 2. Manufacture of food products 3. Processing and preserving meat and 4. Processing and preserving meat. The industrial classification scheme was employed in this study in line with the study's stated interest in understanding the contribution of the various industries to employment creation while also allowing for cross country comparison. Using the ISIC codes in the data, respondents were classified into farming, off-farm stages of the food system and off-farm stages outside the food system. Table A3.1 provides a description of these categories and the key sections of the ISIC classification from which they were drawn. Note that forestry and logging were classified as off-farm employment outside the agrifood system.

The various country data employed different levels of ISIC hierarchical classification in their coding of economic activities allowing for different levels of disaggregation of our sample into various industrial sectors. Generally, the LSMS data (Ghana, Nigeria, Tanzania, Rwanda, Uganda) and labor force survey data (Zambia) employed at least the second level ISIC classification codes allowing for a distinction between off-farm stages within and outside the agrifood system. It also allowed for further disaggregation of the off-farm activities outside the food system into different industrial sectors. However, the data from IPUMS (Kenya, Malawi, Mali) largely used the first and second level of classification, which made disaggregation between off-farm stages within and outside the agrifood system infeasible. Hence, for those countries, both activities were combined as off-farm employment.

1 See link for details of the classification http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27

Table A3.1 Description of employment sector

Industry	Description
Farming	Consist of all those coded under the crop and animal production, hunting and related service activities under the broad section of Agriculture, forestry and fishing.
Off-farm stages of the agrifood system	Consist of both upstream and downstream activities within the agrifood system. Individuals were drawn from 3 main sections of the ISIC classification scheme. Individuals coded under the Manufacturing section engaged in the manufacture of food products, beverages, tobacco products including processors of meat, fish, dairy and crop products as well as livestock feed and concentrates. Individuals coded under the Wholesale and Retail section engaged in the wholesale and/or retail of agricultural raw materials or live animals, food, beverages and tobacco and agro-chemicals Individuals coded under the Accommodation and Food Service Activities' section engaged in food and beverage service activities including restaurants and mobile food service activities, event catering, beverage serving and other food service activities.
Off-farm stages outside the agrifood system	Consist of all economic activities not classified as farming or off-farm stages within the agrifood system. Individuals were drawn mainly from the remaining sections of the ISIC classification and those engaged in activities under the Agriculture, manufacturing, wholesale and retail sections unrelated to the agrifood system. This includes non-food related manufacturing, wholesale and retail trade of non-agricultural products, public administrative services, mining and quarrying, forestry and logging, personal services such as hairdressing etc.

A3.1 Partial Allocation (Treatment of Jobs in Transportation, Wholesale, Retail, and Textile)

For each country, the most detailed ISIC code provided is used for the classification. However, the various country data employed different levels of ISIC hierarchical classification in their coding of economic activities. Those countries providing less detailed codes necessitated a partial allocation of some of the jobs between off-farm stages of the food system and off-farm jobs outside the agrifood system. For instance, at a third level of ISIC coding, *wholesale and retail trade except for motor vehicles and motorcycles* will be subdivided into the following sub-codes consisting of both jobs within and outside the agrifood system.

1. Wholesale on a fee or contract basis
2. Wholesale of agricultural raw materials and live animals
3. Wholesale of food and beverages and tobacco
4. Wholesale of household goods
5. Wholesale of machinery equipment and supplies
6. Other specialized wholesale.

However, if only two levels of ISIC codes is employed, all jobs falling in each of the six sub-codes will be coded as *wholesale and retail trade except for motor vehicles and motorcycles. I*n such instances, the jobs coded in under such codes are proportionally distributed between the off-farm stages of the agrifood system and off-farm stages outside the agrifood system. The proportion of jobs assigned to the downstream stages of the agrifood system varies by country and locality (rural and urban) and is based on the mean ratio of households' share of cash food expenditure in all cash expenditure to the share of non-food agriculture in all agriculture.

Generally, partial allocation of jobs to agrifood system applied mainly to jobs in wholesale, retail trade, and transportation. Table A3.2 provides the detailed coding scheme indicating which codes were fully or partially allocated to the agrifood system. The statements below highlights the proportional allocation for the affected countries:

- In Rwanda, about 38.2% and 42.7% of jobs in wholesale, retail trade, and transportation in urban and rural settings respectively, are allocated to the off-farm stages of the agrifood system. This amounted to a total of 3,351 unweighted observations (591 urban and 2,760 rural) in 2010/11 and 584 (220 urban and 364 rural) unweighted observations in 2005/06.
- In Nigeria 52.5% and 60.7% of jobs in wholesale, retail trade, and transportation in urban and rural respectively, are assigned to the off-farm stages of the agrifood system. This amounted to a total of 1685 unweighted observations (583 urban and 1102 rural) in 2012/13 and 2117 unweighted observations (721 urban and 1396 rural) in 2010/11.
- In Tanzania, 52.7% and 57.9% of jobs in wholesale, retail trade, and transportation in urban and rural respectively, are assigned to the off-farm stages of the agrifood system. This amounted to 1035 unweighted jobs (405 urban and 630 rural) in 2010/11 and 4661 unweighted observations (1699 urban and 2962) in 2012/13.

A3.1.1 Textiles and wearing apparel

In addition to the above, 25% of all jobs in the manufacture, wholesale and retail of textiles, and wearing apparel, were also assigned to the agrifood system. The proportional allocation of 25% of textile jobs is based on the percent share of cotton in total fiber consumption in developing countries as per results from the World Apparel Fiber Consumption Survey[2] (FAO 2013). Note however that, this 25% allocation does not take into account whether the product was manufactured locally or imported. For Rwanda, a total of 152 unweighted textile-related jobs in 2010/11 and 4 unweighted observations in 2005/06 were allocated to the off-farm stages of the agrifood system. Similar allocations of 30 and 115 unweighted textile-related jobs were done for Tanzania 2010/11 and 2012/13 respectively. In Nigeria, textile-related jobs contributed 75 unweighted jobs to the agrifood system in 2012/13. The ISIC codes for Nigeria 2010/11 were at the first level, which does not distinguish textile-related manufacturing or wholesale and retail trade from other activities in the broad category.

A3.2 Sensitivity Analysis on Classification

We examined how results may differ if all transportation and textile jobs are assigned to the off-farm sector outside the agrifood system. Generally, the share of employment in the off-farm stages of the agrifood system declines, by about 3 percent in Nigeria, 1 percentage point in Rwanda and Tanzania and about 0.5 percentage points in Ghana. Generally, the bulk of the jobs in off-farm stages of the agrifood system is in wholesale and retail activities. The proportional allocation of jobs in this sector between the agrifood system and the

2 http://www.textileworld.com/textile-world/fiber-world/2015/02/man-made-fibers-continue-to-grow/

non-farm sector thus has the greatest influence on estimates of employment shares between these two sectors.

A3.2.1 Full time equivalent

In addition to the simple count of people employed in each sector, we also computed the full time equivalent jobs for each employment sector to examine the extent to which the population is dependent on each sector for their employment. A full time equivalent of 40 hours a week, 4 weeks per month for a 12-month year period was assumed for all jobs. To estimate FTEs, the total amount of time in the year devoted to the job was divided by the assumed FTE of 1920 hours/year.

There were instances where data limitations made this general rule inapplicable. In Tanzania 2010/11, data was available for only the total number of months worked per year for those engaged in non-farm self-employment activities. In this case, working 12 months was considered full time. Similarly, engagement in farming activities and unpaid non-farm household enterprises reported only hours worked in the past 7 days. Hence, a full time equivalent of 40 hours in the past week was assumed for those jobs. Rwanda 2005/6 had data on total number of hours worked per day for the past seven day period and number of months worked per year. Total number of hours worked per day was converted into hours per week and a 4 weeks/month was assumed for all jobs. Working 40hrs/week, 4 weeks/month, 12 months/year was then considered full time.

Note: Hours worked per week derived from the person's activity in the past 7 days may not adequately account for seasonality of jobs and hence result in lower FTE levels for seasonal jobs. For instance, where a survey is conducted during the outside the cropping season, the reported time in farming may be 0, which could put the total time devoted to farming to 0 and hence lower the total number of FTE jobs in farming.

A3.3 Other Classification Notes

Mali: The analysis explored changes in employment status between 1998 and 2009 using micro-data available at IPUMS, which is based on 10% of the households interviewed in the General Census of Population and Housing for 1998 and 2009. The ISIC codes reported in the data were at the first level. Therefore, for both years, the farming population consisted of individuals classified under agriculture, fishing and forestry industrial category, which includes some individuals involved in primary forestry activities such as afforestation and logging.

Malawi: The analysis explored changes in employment status between 1998 and 2009 using micro-data available at IPUMS, which is based on 10% of the households interviewed in the Population and Housing Census for 1998 and 2009. The ISIC codes was detailed enough to identify those employed in farming but not those in the off-farm stages of the agrifood system. Hence, in in both years, farming consist of those engaged in crop and animal production including fishing and aquaculture.

Kenya: The analysis explored changes in employment status between 1999 and 2009 using micro-data available at IPUMS, which is based on 5% and 10% of the households interviewed in the original Population and Housing Census for 1999 and 2009 respectively. The data did not report on the industry of employment. Hence, individuals employed in a family holding agricultural activity as primary occupation were classified as farmers for both years.

Nigeria: Two main analyses were conducted for Nigeria. The first analysis explored changes in employment status between 2006 and 2010 using micro-data available at IPUMS, which is based on 0.6% and 0.5% of the households interviewed in the original General Household Survey for 2006 and 2010 respectively. The ISIC codes reported in the data were at the first level. Therefore, for both years, the farming population consisted of individuals classified under agriculture, fishing and forestry industrial category, which includes some individuals involved in primary forestry activities such as afforestation and logging. The second analysis used a more recent data from LSMS and focuses on changes between 2010/11 and 2012/13. Unlike IPUMS, this data consisted of the full sample of households interviewed and contained ISIC codes at least at the second level allowing for a disaggregation of off-farm employment into those within and outside the agrifood system and also account for secondary sources of employment.

Table A3.2 Classification Coding Scheme^

ISIC Section^	ISICx	Description	Assumptions	Justification*
AGRICULTURE, HUNTING, FORESTRY & FISHING	1	Crop and animal production, hunting and related service activities		
	2	Forestry and logging		
	3	Fishing and aquaculture		
MANUFACTURING	10	Manufacture of food products		
	11	Manufacture of beverages		
	12	Manufacture of tobacco products		
	13	Manufacture of textiles	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	14	Manufacture of wearing apparel	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	141	*Manufacture of wearing apparel except for fur*	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	142	*Manufacture of articles of fur*		
	143	*Manufacture of knitted and crochetted apparel*	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	15	Manufacture of leather and related products	x% of jobs in this industry is apportioned to downstream AFS	Jobs here include activities involving the use of leather and leather substitute in manufacturing. Hence, the partial allocation
	151	*Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur*	x% of jobs in this industry is apportioned to downstream AFS	Jobs here include activities involving the use of leather and leather substitute in manufacturing. Hence, the partial allocation
	1511	*Tanning and dressing of leather; dressing and dyeing of fur*		
	1512	*Manufacture of luggage, handbags and the like, saddlery and harness*	x% of jobs in this industry is apportioned to downstream AFS	Jobs here include activities involving the use of leather substitute in manufacturing. Hence, the partial allocation
	152	*Manufacture of footwear*	x% of jobs in this industry is apportioned to downstream AFS	Jobs here include activities involving the use of leather and leather substitute in manufacturing. Hence, the partial allocation
WHOLESALE AND RETAIL TRADE	46*	Wholesale trade, except of motor vehicles and motorcycles	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	461	*Wholesale on a fee or contract basis*	x% of jobs in this industry is apportioned to downstream AFS	Jobs in industry include thoses related to agricultural products sales
	[illegible]		Misspecified code: Code as 46	
	[illegible]		Misspecified code: Code as 461	
	462	*Wholesale of agricultural raw materials and live animals*		
	463	*Wholesale of food, beverages and tobacco*		
	464	*Wholesale of household goods*	25% of jobs in this industry is apportioned to downstream AFS	Jobs in industry involves wholesale of textiles
	4641	*Wholesale of textiles, clothing and footwear*	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	4649	*Wholesale of other household goods*		

ISIC Section^	ISICx	Description	Assumptions	Justification*
WHOLESALE AND RETAIL TRADE	465	*Wholesale of machinery equipment and supplies*	x% of jobs in this industry is apportioned to downstream AFS	1 of 4 subcodes is directly AFS (sale of agricultural machinery)
	4651	*Wholesale of computers, computer peripheral equipment and software*		
	4652	*Wholesale of electronic and telecommunications equipment and parts*		
	4653	*Wholesale of agricultural machinery, equipment and supplies*		
	4659	*Wholesale of other machinery and equipment*		
	466	*Other specialized wholesale*		
	4661	*Wholesale of solid, liquid and gaseous fuels and related products*		
	4662	*Wholesale of metals and metal ores*		
	4663	*Wholesale of construction materials, hardware, plumbing and heating equipment and supplies*		
	[illegible]		Misspecified code: Code as 46	
	4669	*Wholesale of waste and scrap and other products n.e.c.*		
	4690	*Non-specialized wholesale trade*		
	47*	Retail trade, except of motor vehicles and motorcycles	x% of jobs in this industry is apportioned to downstream AFS	Subcodes include AFS related activities
	471	*Retail sale in non-specialized stores*	x% of jobs in this industry is apportioned to downstream AFS	1 out of 2 sub codes in AFS
	4711	*Retail sale in non-specialized stores with food, beverages or tobacco predominating*		
	[illegible]		Misspecified codes. Code as 471	
	[illegible]		Misspecified codes. Code as 471	
	[illegible]		Misspecified codes. Code as 471	
	4719	*Other retail sale in non-specialized stores*		
	472	*Retail sale of food, beverages and tobacco in specialized stores*		
	4721	*Retail sale of food in specialized stores*		
	4722	*Retail sale of beverages in specialized stores*		
	4723	*Retail sale of tobacco products in specialized stores*		
	[illegible]		Misspecified codes. Code as 472	
	473	*Retail sale of automotive fuel in specialized stores*		
	474	*Retail sale of information and communication equipment in specialized stores*		
	4741	*Retail sale of computers, peripheral units, software and telecommunications equipment in specialized stores*		
	4742	*Retail sale of audio and video equipment in specialized stores*		

Color code	Completely within agri-food system	Partially within agri-food system	Misspecified codes	Completely outside agri-food system

Table A3.2 Classification Coding Scheme^ (cont'd)

ISIC Section^	ISICx	Description	Assumptions	Justification*
WHOLESALE AND RETAIL TRADE	475	*Retail sale of other household equipment in specialized stores*		AFS share is negligible. Textile which we are allocating 25% is just 1 of 4 subcodes
	4751	*Retail sale of textiles in specialized stores*	25% of jobs in this industry is apportioned to downstream AFS	25% assigned to textiles and clothing items based on FAO report suggesting 26% share of cotton in total fibre consumption in developing countries
	4752	*Retail sale of hardware, paints and glass in specialized stores*		
	4753	*Retail sale of carpets, rugs, wall and floor coverings in specialized stores*		
	4759	*Retail sale of electrical household appliances, furniture, lighting equipment and other household articles in specialized stores*		
	476	*Retail sale of cultural and recreation goods in specialized stores*		
	4761	*Retail sale of books, newspapers and stationary in specialized stores*		
	4762	*Retail sale of music and video recordings in specialized stores*		
	4763	*Retail sale of sporting equipment in specialized stores*		
	4764	*Retail sale of games and toys in specialized stores*		
	477	*Retail sale of other goods in specialized stores*		AFS share is negligible. Retail of clothing which we are allocating 25% is just 1 of 4 subcodes
	4771	*Retail sale of clothing, footwear and leather articles in specialized stores*	x% of jobs in this industry is apportioned to downstream AFS	
	4772	*Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles in specialized stores*		
	4773	*Other retail sale of new goods in specialized stores*		
	4774	*Retail sale of second-hand goods*		
	4775		Misspecified code: Code as 477	
	478	*Retail sale via stalls and markets*	x% of jobs in this industry is apportioned to downstream AFS	Sub-codes includes jobs directly related to the AFS
	4781	*Retail sale via stalls and markets of food, beverages and tobacco products*		
	4782	*Retail sale via stalls and markets of textiles, clothing and footwear*	25% of jobs in this industry is apportioned to downstream AFS	
	4784		misspecified codes. Code as 478	
	4785		misspecified codes. Code as 478	
	4787		misspecified codes. Code as 478	
	4789	*Retail sale via stalls and markets of other goods*		
	479	*Retail trade not in stores, stalls or markets*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	4791	*Retail sale via mail order houses or via Internet*		
	4799	*Other retail sale not in stores, stalls or markets*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)

ISIC Section^	ISICx	Description	Assumptions	Justification*
TRANSPORTATION AND STORAGE	**49***	Land transport and transport via pipelines	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	491	*Transport via railways*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	4911	*Passenger rail transport, interurban*		
	4912	*Freight rail transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	492	*Other land transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	4921	*Urban and suburban passenger land transport*		
	4922	*Other passenger land transport*		
	4923	*Freight transport by road*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	493	Transport via pipeline		
	50	Water transport	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	501	*Sea and coastal water transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	5011	*Sea and coastal passenger water transport*		
	5012	*Sea and coastal freight water transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	502	*Inland water transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	5021	*Inland passenger water transport*		
	5022	*Inland freight water transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)

Color code	Completely within agri-food system	Partially within agri-food system	Misspecified codes	Completely outside agri-food system

Table A3.2 Classification Coding Scheme^ (cont'd)

ISIC Section^	ISICx	Description	Assumptions	Justification*
TRANSPORTATION AND STORAGE	**51**	Air transport	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	511	*Passenger air transport*		
	512	*Freight air transport*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	52*	Warehousing and support activities for transportation	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	521	*Warehousing and storage*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	522	*Support activities for transportation*	x% of jobs in this industry is apportioned to downstream AFS	x% depends on the proportion of agricultural trade in the economy and varies by country and locality (rural, urban)
	53	Postal and courier services		
FOOD SERVICES	**56**	Food and beverage service activities		
OTHER	**75**	Veterinary activities		

Color code	Completely within agri-food system	Partially within agri-food system	Misspecified codes	Completely outside agri-food system

^ This table covers only the sections of the ISIC classification involving agrifood-related jobs. Jobs in the following sections of the ISIC classifications not covered in this table were coded as off-farm employment outside the agrifood system: 1. Mining and quarrying; 2. Electricity, gas, steam and air conditioning supply; 3. Water supply, sewerage, waste management and remediation activities; 4. Construction; 5. Information and communication; 6. Finance, insurance, and real estate; 7. Professional scientific and technical activities; 8. Administrative and support services; 9. Public administration and defense; 10. Education, human health and social work; 11. Arts, entertainment, and recreation; 12. Activities of households as employers; 13. Activities of extraterritorial organizations and bodies.

**x% of jobs assigned to the downstream stages of the agrifood system varies by country and locality (rural and urban) and is based on the ratio of the share of cash food expenditure to the share of non-food agriculture in all agriculture.*

ANNEX 4:
DETAILED EMPLOYMENT TABLES

Table A4.1. Changes in employment of working age population in Tanzania (based on all sources of employment specified by survey respondents).

	# of jobs (weighted #s)				Annual % change in # of working age population in age categories				
	2010/11	2012/13	annual % change		15-24	25-34	35-44	45-54	55-64
Urban									
Farming	862,520	1,188,194	18.9		29.3	12.7	8.2	20.0	14.8
Male	369,899	528,905	21.5		33.4	12.8	15.7	16.4	6.3
Female	492,621	659,289	16.9		24.3	12.6	4.3	21.9	22.6
Off-farm within agri-food system	1,150,698	1,352,747	8.8		16.3	8.3	20.8	-9.4	-9.1
Male	488,330	530,195	4.3		11.6	-0.8	22.9	-13.1	-13.9
Female	662,367	822,552	12.1		19.6	14.8	19.0	-6.8	-5.5
Off-farm outside agri-food system	2,564,033	2,871,345	6.0		14.9	4.6	4.9	-3.1	8.5
Male	1,509,523	1,723,549	7.1		20.0	3.3	10.8	-6.9	17.7
Female	1,054,510	1,147,795	4.4		9.9	6.8	-2.4	5.9	-4.4
Unemployed	375,292	335,112	-5.4		-2.1	-13.0	-4.9	-13.2	401.0
Male	117,048	118,674	0.7		1.6	-16.5	149.8	47.4	#VALUE!
Female	258,244	216,437	-8.1		-4.8	-12.0	-8.2	-24.2	164.0
Economically inactive	1,724,528	1,572,302	-4.4		-8.1	7.1	11.6	11.6	2.1
Male	669,149	509,371	-11.9		-13.9	0.1	348.8	139.5	13.3
Female	1,055,379	1,062,930	0.4		-3.2	8.6	5.1	7.3	16.7
Total # urban individuals in working-age	7,193,137	7,504,586	2.2		-0.2	3.0	7.5	-0.9	5.1
Total # of males	3,333,024	3,516,672	2.8		-0.1	2.8	14.1	-4.7	6.0
Total # of females	3,860,113	3,987,914	1.7		-0.3	3.2	2.2	3.0	4.2
Rural									
Farming	10,038,742	10,874,133	4.2		9.1	1.5	-0.3	1.7	3.4
Male	4,620,234	4,997,809	4.1		9.8	2.1	-2.8	-1.9	4.2
Female	5,418,508	5,876,324	4.2		8.4	1.1	1.3	4.9	2.7
Off-farm within agri-food system	1,420,713	1,481,432	2.1		13.3	1.4	-6.1	18.2	-5.3
Male	654,421	692,994	2.9		21.7	3.3	-13.8	23.5	-1.9
Female	766,293	788,438	1.4		6.2	-0.1	-2.9	14.3	-7.8
Off-farm outside agri-food system	2,373,618	2,606,457	4.9		25.9	1.5	0.9	-4.9	-3.2
Male	1,499,624	1,644,377	4.8		21.5	2.7	1.1	-3.5	0.9
Female	873,995	962,080	5.0		33.0	-0.6	0.7	-7.5	-10.4
Unemployed	261,004	91,157	-32.5		-30.9	-33.2	-37.1	-43.5	-34.9
Male	101,049	39,649	-30.4		-25.9	-40.3	-48.2	-50.0	-16.1
Female	159,955	51,508	-33.9		-34.3	-28.6	-33.8	-40.9	#VALUE!
Economically inactive	1,980,741	1,172,758	-20.4		-22.3	-1.7	-27.6	3.6	-5.9
Male	1,006,421	526,088	-23.9		-25.4	-10.0	-22.3	32.9	-13.0
Female	974,320	646,670	-16.8		-18.9	3.0	-31.5	-6.2	-2.6
Total # of rural individuals in working-age	16,436,125	16,608,472	0.5		1.5	0.2	-2.1	1.5	0.8
Total # of males	8,023,215	8,101,169	0.5		1.9	0.8	-3.6	-0.2	2.1
Total # of females	8,412,910	8,507,303	0.6		1.1	-0.3	-0.8	3.1	-0.4
Totals									
Total in working age population	23,629,262	24,113,058	1.0		1.0	1.2	0.7	0.9	1.8
Total # of males	11,356,239	11,617,840	1.2		1.3	1.5	1.4	-1.4	3.1
Total # of females	12,273,023	12,495,217	0.9		0.6	1.0	0.0	3.1	0.7

Color scheme **Negative** red **0.1-10.** yellow **10.1-20.** green **above 20** blue

Accounts for all sources of employment specified by respondents. 2007/08 NPS surveys was not used because it was structured to ask about a relatively limited number of potential employment options.

Source: Tanzania National Panel Survey (2010/11 and 2012/13)

Table A4.2 Changes in employment of working age population in Nigeria, LSMS data

	# of jobs (weighted #s)			Annual % change in # of working age population in age categories				
	2010/11	2012/13	annual % change	15-24	25-34	35-44	45-54	55-64
Urban								
Farming	3,013,181	3,509,024	8.2	38.7	29.1	49.2	49.2	31.9
Male	1,933,636	2,184,948	6.5	46.9	29.0	40.7	69.3	27.4
Female	1,079,546	1,324,076	11.3	26.1	29.2	67.3	29.7	42.3
Off-farm within agri-food system	5,055,425	6,025,676	9.6	-3.9	2.3	28.4	25.4	25.7
Male	1,988,630	1,860,802	-3.2	-9.2	-10.5	11.7	6.2	29.8
Female	3,066,795	4,164,874	17.9	1.9	9.6	39.2	37.2	23.9
Off-farm outside agri-food system	14,946,329	14,992,524	0.2	0.3	5.8	15.3	11.3	14.9
Male	8,011,475	8,177,845	1.0	-1.7	9.5	15.7	9.9	23.5
Female	6,934,853	6,814,679	-0.9	2.4	2.4	14.8	13.3	6.1
Unemployed	1,177,531	1,307,103	5.5	-0.1	12.5	5.4	-13.9	2.4
Male	637,652	710,483	5.7	-10.2	17.1	75.5	-3.3	9.7
Female	539,878	596,620	5.3	19.5	7.9	-15.9	-34.6	-7.1
Economically inactive	11,413,139	12,389,755	4.3	3.4	12.5	2.4	-14.1	3.6
Male	4,927,212	5,621,582	7.0	5.9	18.1	40.8	-17.3	-7.7
Female	6,485,926	6,768,173	2.2	1.0	9.8	-2.6	-13.4	12.9
Total # urban individuals in working-age	34,725,711	34,598,504	-0.2	0.0	-1.3	-0.2	-1.5	4.3
Total # of males	16,576,363	16,420,094	-0.5	1.8	-1.8	-2.8	-5.3	5.7
Total # of females	18,149,348	18,178,410	0.1	-1.7	-1.2	2.2	2.6	3.0
Rural								
Farming	20,040,249	25,790,554	14.3	31.6	24.0	23.8	21.1	30.6
Male	11,932,042	16,105,825	17.5	41.1	20.9	28.1	28.3	31.4
Female	8,108,207	9,684,730	9.7	15.2	27.9	18.2	11.6	29.2
Off-farm within agri-food system	6,550,443	8,625,843	15.8	30.5	18.0	42.3	58.4	53.9
Male	2,105,059	2,459,939	8.4	43.7	10.6	65.7	82.7	66.0
Female	4,445,384	6,165,904	19.4	25.1	20.1	36.0	49.3	47.3
Off-farm outside agri-food system	12,682,155	10,730,724	-7.7	-4.4	7.9	8.5	21.2	33.0
Male	6,685,848	6,063,825	-4.7	0.5	20.8	26.2	25.2	39.0
Female	5,996,306	4,666,899	-11.1	-8.1	0.2	-6.7	15.1	23.7
Unemployed	944,071	558,390	-20.4	-21.4	-20.8	-19.4	52.0	-27.0
Male	463,160	345,713	-12.7	-15.8	-9.4	-11.0	#VALUE!	#VALUE!
Female	480,911	212,676	-27.9	-26.7	-31.1	-34.9	52.0	-27.0
Economically inactive	15,585,071	17,327,208	5.6	6.1	5.4	5.0	12.8	-4.8
Male	6,094,414	6,492,004	3.3	2.5	12.7	77.3	-8.2	-21.0
Female	9,490,658	10,835,204	7.1	10.0	3.3	2.3	15.1	1.0
Total # of rural individuals in working-age	50,834,045	54,476,627	3.6	7.0	0.9	-0.6	4.7	5.5
Total # of males	24,104,669	25,749,353	3.4	6.9	1.3	-0.7	0.6	5.6
Total # of females	26,729,376	28,727,274	3.7	7.1	0.6	-0.5	8.9	5.3
Totals								
Total in working age population	85,559,756	89,075,132	2.1	4.1	-0.1	-0.5	2.1	5.0
Total # of males	40,681,032	42,169,447	1.8	4.9	0.0	-1.5	-1.9	5.6
Total # of females	44,878,724	46,905,684	2.3	3.3	-0.1	0.4	6.3	4.4
Color scheme	**Negative**	red	**0.1-10.** yellow	**10.1-20.** green		**above 20** blue		

Accounts for all jobs per person

Working age group defined as those within 15-64 years old

Farming comprises of activities of growing crops and raising animals including fishing and aquaculture and hunting

Source: Nigerian General Household Survey 2010/11 and 2012/13

Table A4.3. Changes in employment of working age population by sector, Rwanda

	# of jobs (weighted #s)				Annual % change in # of working age population in age categories				
	2005/6	2010/11	annual % change		15-24	25-34	35-44	45-54	55-64
Urban									
Farming	337,684	459,981	7.2		-0.9	13.0	8.3	8.1	14.6
Male	134,505	179,420	6.7		-1.2	13.5	7.5	11.0	12.6
Female	203,178	280,562	7.6		-0.3	12.7	8.7	6.5	15.8
Off-farm within agri-food system	98,746	105,966	1.5		-2.4	3.8	5.1	0.1	-6.6
Male	39,550	54,972	7.8		0.0	12.8	14.7	3.3	0.3
Female	59,196	50,994	-2.8		-4.3	-2.3	0.6	-1.7	-9.1
Off-farm outside agri-food system	404,482	558,051	7.6		1.5	10.4	14.0	7.3	13.8
Male	235,716	328,624	7.9		2.5	12.4	9.7	5.6	8.9
Female	168,766	229,427	7.2		0.5	7.5	23.0	11.1	23.3
Unemployed	14,369	34,867	28.5		33.1	27.6	29.3	1.9	#VALUE!
Male	8,223	11,493	8.0		11.8	6.2	6.3	-6.8	#VALUE!
Female	6,146	23,374	56.1		68.3	51.0	51.2	24.3	#VALUE!
Economically inactive	218,757	192,960	-2.4		-1.0	-6.3	5.5	-11.8	-4.7
Male	89,291	84,632	-1.0		-0.9	-0.2	1.6	-8.1	-2.5
Female	129,465	108,328	-3.3		-1.2	-8.0	-7.5	-14.1	-5.9
Total # urban individuals in working-age	897,611	937,357	0.9		-1.5	3.1	2.9	-0.4	4.4
Total # of males	424,174	445,640	1.0		-2.0	4.9	2.5	-0.8	3.7
Total # of females	473,437	491,717	0.8		-1.2	1.6	3.4	0.0	4.9
Rural									
Farming	4,216,393	5,641,032	6.8		0.3	12.1	7.2	7.6	15.6
Male	1,817,689	2,428,028	6.7		0.5	12.3	7.5	7.1	15.3
Female	2,398,704	3,213,004	6.8		0.2	12.0	7.0	8.0	15.9
Off-farm within agri-food system	314,849	506,558	12.2		10.2	17.3	9.3	7.9	53.3
Male	159,978	262,580	12.8		14.9	14.8	11.5	6.8	7.9
Female	154,871	243,978	11.5		5.8	20.7	7.4	9.0	#DIV/0!
Off-farm outside agri-food system	683,850	1,784,285	32.2		27.1	38.4	28.6	35.0	34.5
Male	495,409	1,161,536	26.9		22.2	32.7	23.3	28.0	30.6
Female	188,441	622,749	46.1		37.8	55.5	43.0	55.3	44.8
Unemployed	3,717	11,310	40.9		45.9	36.9	-4.9	#VALUE!	#VALUE!
Male	2,102	7,038	47.0		61.6	36.6	-4.9	#VALUE!	#VALUE!
Female	1,615	4,271	32.9		29.7	37.3	#VALUE!	#VALUE!	#VALUE!
Economically inactive	623,009	826,512	6.5		7.0	10.0	2.7	5.0	-2.5
Male	332,962	428,148	5.7		6.2	11.9	-3.1	8.7	-3.9
Female	290,047	398,364	7.5		8.0	7.9	-1.3	-2.9	0.1
Total # of rural individuals in working-age	4,125,610	4,858,039	3.6		0.7	6.8	3.3	3.7	8.4
Total # of males	1,886,639	2,238,443	3.7		0.9	7.2	3.9	4.0	7.3
Total # of females	2,238,972	2,619,596	3.4		0.5	6.4	2.8	3.5	9.4
Totals									
Total in working age population	5,075,138	5,795,397	2.8		0.2	6.0	3.2	3.1	7.9
Total # of males	2,334,636	2,684,083	3.0		0.4	6.7	3.7	3.3	6.9
Total # of females	2,740,502	3,111,314	2.7		0.2	5.4	2.9	3.0	8.8

Color scheme **Negative** red **1-50.** yellow **51-100** green **101 or more** blue

Working age group defined as those within 15-64 years old

Rural-urban classification of both surveys are based on the corresponding geographical designations from the 2002 Rwanda Census of Population and Housing and hence may not reflect current status of these areas. Hence, the estimated total urban population from the 2010/11 survey data does not represent the expected urban expansion of the population.

~Accounts for all jobs per person

Source: Rwanda Integrated Household Living Survey (EICV2 & 3).

ANNEX 5:
AGYEES LANDSCAPE INTERVIEW GUIDE

BIG PICTURE QUESTIONS

1. Value Chains: What are changes in the value chain? How does this affect supply and demand for skills, opportunities for youth, etc.?

- Have you seen changes in the agrifoods sector over the past 5 years? If so, could you please describe these changes?
    - How have you seen people/industries/the public sector adapting to these changes?
- Where do you see trends going in the future—next 5 years and beyond?
    - How do you think this will affect opportunities for youth within the sector? (Do you see differences by gender?)
- Do you see any problems affecting young peoples' abilities to get good jobs in the agrifoods sector or start their own firms? If so, what do you see as the main problems?
    - Are problems different in the upstream vs. downstream parts of the agrifood sector? If so, how?

2. Gender Considerations

- Within the above questions, what are the gender differences or gender considerations?

3. Stakeholder Mapping: In light of these basic forces of economic change, how can access to land rights, capital, training, and market opportunities be used to improve youth employment prospects? Are programs addressing forecasting?

- In light of these basic forces of economic change, can access to land rights, capital, training, and market opportunities be used to improve youth employment prospects? If so, how? (perhaps ask them to identify the most important issues—2 or 3—to address to improve youth)
- Which policies and programs are most successfully addressing these issues? Where are the gaps?
- What is the relationship among policymakers, those providing training to youth entering the agrifood sector, and industry? (Donor implemented? Public institutions?)
    - Is there communication? What structures are in place for communicating among policymakers, implementers, and industry? Is the communication currently effective?
- Has the program/office/company communicated/consulted with other stakeholders (youth, private sector, NGOs, donors, industry) with regard to youth employment/opportunities in the agrifood sector (in program design, to communicate desired skills, to gather input for policy, etc)?
    - If so, who? How were the consultations done and how did they impact the program?
    - Do you maintain contact/relationships with these or other such organizations? If so, how?
    - Are there any stakeholders with which you would like to cultivate new relationships/collaborations? Which? Why these?

SUPPLY-SIDE STAKEHOLDERS

1. Supply of Workers

- How is your program designed? (Who is training, who are the targets, content, focus, lessons, learned, perceived successes and gaps)
- Please tell us a bit about your program's design
    - What groups are targeted for training?
    - What major challenge(s) related to youth employment and training does program X address?
    - How does it address these challenges?
    - Who is conducting the training? (What types of credentials do trainers have?)
    - How is the program funded?
    - Clarify as needed areas where the program works, numbers reached, key objectives.
- What have been major results so far?
- What do you consider to be the greatest accomplishment(s) of this program?
    - In the area of youth employment generation in (country) in general?
- What have been the implementation challenges so far?
- What lessons have been learned—for a future program, what would you keep or change from the current program?
- Will the program be sustained after this project ends? How?
- Do you have any concerns about the direction of these activities on the ground and/or with respect to the socio-economic environment of this country?

2. Demand for skills

- What are your program's interactions with industry and public sector (Some of these are covered above under "communication with stakeholders." Confirm that these questions have been answered.)
- What feedback, if any, have you received from industry/public sector/employers on your program?
- Do you keep track of students who have successfully completed your program to know their success in finding employment, and where, and potential feedback on the training program?
    - How do programs perceive demand for youth skills?
    - What kinds of skills do graduates acquire through your program?
    - What kinds of skills/competencies do you think are most important to potential employers? For those starting businesses?
    - Many employer reports state that students are lacking soft skills and that this is a key element missing from many training programs. What do you think of this? What is your organization's view on the right mix of the type of skills needed to prepare students for employment?
    - Do you perceive a difference between the training provided by donors and private sector institutions and that of the formal public sector education/TVET institutions?

3. Policy (Some of these are covered above under "mapping stakeholders" and "communication with stakeholders." Confirm that these questions have been answered.)

- What are the relationships between policymakers and program implementers? (Donor implemented? Public institutions?)
- In addition to training, in your view which government policies are most important in determining the agrifoods sector opportunities/roles that youth will have in the future? (A version of this is asked in "mapping stakeholders" section.)
    - Does the government have a role in promoting job creation in this sector? Facilitating start up of new businesses? Promoting youth access to land? How could youth access to finance be improved?
- What are their perceptions of policy successes and gaps?
- How do they interact with or address policy?
    - Which policies most influence your work? How do they influence your work?

DEMAND-SIDE STAKEHOLDERS

1. Overall questions

- What does this firm (and any related businesses of the same owner) do? What parts of the agrifood system—upstream and downstream—does your business operate in?
- With what other firms do you do business? Who do you consider your most serious competitors?
- To what extent does your company source its inputs/raw materials locally vs. regionally (other countries in Africa) vs. internationally?

2. Supply of Workers

- What are the desired skills for workers?
- What are the general skill requirements for employees? And for the youth in particular?
    - What kinds of skills should graduates have upon leaving these institutions to meet the needs of your company?
- Will skills/compentencies need to change to prepare youth for future roles in the agrifoods sector?
    - If so, what do you see as the main problems?
- Where are employees trained, and what perceptions do you have of the quality of those training institutions?
    - If employees receive training, where do they get it (from the employer, vocational/technical school/university)?
        - In your view, do these institutions provide adequate levels of training?
        - If not, what improvements are needed? What are your expectations about the types of skills and training that these institutions should provide?
        - Do you see a difference between those trained by public institutions (secondary schools/universities/TVET programs) and those trained in private or donor-funded programs?
    - Does your firm provide additional training to employees after they are hired? What types of training? Mentorships? Apprenticeships?
- What are the interactions between the private sector and training providers?
    - Do you or others from the company participate in training activities, e.g., discuss your requirements/expectations with training institutions, provide feedback on curricula, or provide internships to students? (What is your relationship, if any, to the institutions that are training youth in the agrifoods sector? Specific examples of interaction if possible.)

- Does your company communicate/consult with other stakeholders (youth, private sector, NGOs, other donors, including GOR units) as you consider improvements and future directions for your business?

3. Demand

- What types of jobs are available for youth in the agrifoods sector?
- Do you see any problems affecting young peoples' abilities to gain employment in your company or line of work? Do you see any problems with young people's abilities to start their own businesses in the sector?
    - If so, what do you see as the main problems?
- Expanding the demand side (how, any efforts?)
- Do you see any growing opportunities for young people in your company or line of work at this time? If so, what are these?

4. Policy

- What are your perceptions of policy successes and gaps?
- What public sector programs have proved helpful to your business? What public sector programs have proved a hindrance?
- How do they interact with or address policy?

Government Stakeholders

1. Supply of Workers and Demand of workers

- With which key stakeholders related to youth employment opportunities in the agrifood sector do you interact?
- How do they interact with these stakeholders?
- What are the greatest successes you see? Where do you see gaps?

2. Policy

- What have been the major results of current policies? (refer to the policies that are related to their work or unit)
- Are there policy gaps that remain? Is your unit addressing these? If so, how?
- What data sources are used in formulating policy?
- What data sources do you or your unit draw on in formulating policy?
    - Could you share any relevant sources of data or relevant reports?

ANNEX 6:
LANDSCAPE ANALYSIS INTERVIEWS

RWANDA

Organization Type	Organization Name
Private Sector	ABASHIRIKABUTE BA GASABO Cooperative
Int'l Donor	African Development Bank
Int'l Implementer	Agri Pro Focus
Local Implementer	Akilah Institute for Women
GOR	Business Development Fund
Int'l Implementer	Dot Rwanda
Int'l Implementer	EDC
Int'l Donor	Food and Agriculture Organization of the United Nations (FAO)
Int'l Donor	GIZ
Private Sector	H20 Venture Partners
GOR	Integrated Polytechnical Regional Center (IPRC) South
GoR	Kigali Employment Service Center
Private Sector	Kitabi Tea Factory managed by Rwanda Mountain Tea
GoR	KLab
Private Sector	MICOF Mibrizi Coffee and Food Stuffs
GOR	Ministry of Agriculture and Animal Resources (MINAGRI)
GOR	Ministry of Public Service and Labor (MIFOTRA)
GOR	Ministry of Trade and Industries
GoR	Muhabura Polytechnic
GOR	National Agricultural Export Board (NAEB)
Int'l Implementer	Practical Agriculture Institute
GoR	Private Sector Federation
GoR	RULINDO District
GOR	Rwanda Cooperative Agency (RCA)
GOR	Rwanda Development Board (RDB)
Local Implementer	Rwanda Youth Organisation for Sustainable Development (RYOSD)
Private Sector	San Francisco Bay Coffee
Private Sector	Shekinah Industries
Private Sector	Sina Gerard Urwibutso Esq.
Int'l Implementer	SNV
Int'l Implementer	SPARK Rwanda
Int'l Implementer	TechnoServe
Local Implementer	The Strive Foundation

Organization Type	Organization Name
Int'l Donor	United Nations Development Programme
Local Implementer	University of Rwanda
Int'l Donor	USAID
Int'l Implementer	VVOB
GOR	Workforce Development Authority (WDA)
Int'l Donor	World Bank
Local Implementer	YES Rwanda (Youth Employment Systems)

TANZANIA

Organization Type	Organization Name
GOT	Agricultural Development Bank
Local Implementer	Agricultural Non-State Actors Forum (ANSAF)
Private Sector	Association of Tanzanian Employers
Int'l Implementer	BRAC
Private Sector	CRDB Bank
Private Sector	Crop Bioscience Solutions
Int'l Implementer	DAI
GOT	Department of Policy and Planning; Ministry of Agriculture, Livestock, & Fisheries
Private Sector	East Africa Grain Council
Private Sector	FRABHO Enterprises, Ltd.
Private Sector	Home Veg Tanzania
Local Implementer	Innovative Agricultural Research Initiative (iAGRI)
Int'l Donor	International Labor Organization
Private Sector	Magole Farms
Private Sector	Matuli Company
GOT	Ministry of Agriculture, Food, and Cooperatives
GOT	Ministry of Labor
GOT	Ministry of Trade
GOT	National Economic Empowerment Council (NEEC)
Local Implementer	Nelson Mandela Institute of Science and Technology
Private Sector	Noble Motors
Int'l Implementer	Opportunity International
Private Sector	Rice Council of Tanzania
Private Sector	Silverlands Company
GOT	Small Industries Development Organization (SIDO)
Int'l Implementer	SNV
Local Implementer	Sokoine University Graduate Entrepreneurs' Cooperative (SUGECO)

Organization Type	Organization Name
Local Implementer	Sokoine University of Agriculture (SUA)
Private Sector	Southern Agricultural Growth Corridor of Tanzania (SAGCOT)
GOT	Tanzania Employment Services Agency
Local Implementer	Tanzania Entrepreneurship and Competitiveness Centre (TECC)
GOT	Tanzania Federation of Co-operatives
Private Sector	Tanzania Horticultural Association
Private Sector	Tanzania Private Sector Foundation
Int'l Implementer	TechnoServe
Int'l Donor	USAID
GOT	Vocational Education and Training Authority (VETA) Changombe
GOT	Vocational Education and Training Authority (VETA) Morogoro

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