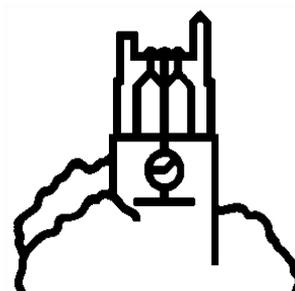


MSU International Development Working Paper

Agri-Food Systems and Youth Livelihoods in Sub-Saharan Africa

by

T. S. Jayne, John S. Holtzman, Felix Kwame Yeboah, Jock R. Anderson, and James F. Oehmke



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**T. S. Jayne, John S. Holtzman, Felix Kwame Yeboah, Jock R. Anderson,
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October 2016

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This report is a synthesis of roundtable discussions and other evidence. It does not necessarily represent the views of the United States Agency for International Development, the United States Government, or of any particular participants in the roundtable events.

EXECUTIVE SUMMARY

As part of broader efforts to address major global challenges—such as climate change, urbanization, gender equality, and nutrition—Feed the Future, the U.S. Government's global hunger and food security initiative, hosted a series of Roundtable Discussions in early 2016. These meetings brought together a diverse set of specialists to identify new emerging issues and strategies for effectively achieving the new Sustainable Development Goals (SDGs). Toward this end, Feed the Future assembled 44 academics and representatives of African governments, field-based youth programs and development organizations on May 17, 2016 in Washington, DC for the *Youth & Employment Roundtable Symposium*. This report summarizes the evidence and discussion presented at this Roundtable, with a particular focus on youth livelihoods and employment and implications for the development of food systems in Sub-Saharan Africa. We conclude by summarizing views expressed about emerging opportunities and challenges facing African governments associated with the huge influx of young people into Africa's labor force and the broad strokes of a strategy that anticipates and responds to these opportunities and challenges.

The world will experience unprecedented demographic shifts during the 21st century. The share of the world's population living in Sub-Saharan Africa (SSA) will have risen from 12% in 2015 to 36% in 2100. Africa will exert growing impact on the world economy, including the global food system, and this impact will be largely determined by young Africans between 15 and 35 years of age who now account for 55% of the region's labor force. Every year, roughly 11 million young Africans are entering the labor force. Under the most favorable projections, only a quarter of these new workers over the next decade will find wage jobs. Agriculture and the informal sector will need to absorb most youth into gainful employment or Africa and other regions of the world will face escalating challenges resulting from youth under-employment.

Over the past 15 years, African governments that have effectively promoted farm productivity growth have enjoyed faster rates of poverty reduction, higher rates of labor productivity in the non-farm segments of the economy, and a more rapid exit of the labor force out of farming. Because the economies of most African countries still depend largely on the performance of agriculture, public investments in support of agricultural productivity growth will remain a crucial component of an effective youth employment strategy. Often considered more of a burden than a benefit, Africa's youthful workforce could open up a wide range of economic opportunities in farming, in the downstream stages of agri-food systems and in the broader non-farm economy with the right mix of policies and public investments toward agriculture.

African governments would be well served to adopt a multi-pronged youth livelihoods strategy: First, focus on investing in agricultural productivity growth to create new opportunities for youth in farming and generate the multiplier effects that expand the number of job opportunities for youth in the broader off-farm economic system. Second, invest in education and skill development to enable young people to derive more money and satisfaction from the opportunities that arise. This means redoubling public investments in basic, secondary and tertiary education, vocational and technical training, and soft skills. But more research is urgently needed to determine what forms of education and skill training provide the greatest payoffs to young people, recognizing that the answers are likely to differ across Africa given wide differences in economic conditions.

CONTENTS

ACKNOWLEDGMENTS	iii
EXECUTIVE SUMMARY	iv
LIST OF TABLES	vi
LIST OF FIGURES	vi
ACRONYMS	vii
1. BACKGROUND	1
2. SUMMARY	2
3. EVIDENCE.....	3
3.1. Population Trends	3
3.2. Rural Population Growth and Migration	4
3.3. Agricultural Productivity Growth and Shifts in the Labor Force	5
3.4. Urbanization and Urban Population Growth	7
3.5. Shifts in the Rural Labor Force to Non-Farm Employment	8
3.6. Youth and Entrepreneurship	10
3.7. Entrepreneurship (and Technical) Training	10
3.8. Policy and Regulatory Constraints to Youth Entrepreneurship	11
3.9. Diversification and Entrepreneurship	12
4. POLICY IMPLICATIONS: ADDRESSING THE NEEDS OF RURAL YOUTH	13
4.1. Youth and Farming	13
4.2. Skills Required by Youth in Emerging Agri-Food Systems	14
4.3. Evolving Role of Agriculture in Expanding Youth Livelihoods	14
5. CONCLUSIONS AND NEXT STEPS.....	16
REFERENCES	17

LIST OF TABLES

Table	Page
1. Changes in the Share of Total Jobs among the Working Age Population (15–64 Years) in Farming, in Off-Farm Jobs within Agri-Food Systems (AFS), and in Non-Farm Jobs (Non-AFS)	9

LIST OF FIGURES

Figure	Page
1. Population Projections for Sub-Saharan Africa and the Rest of World.....	3
2. Projected Population Aged Less Than 15 Years.....	4
3. Trends in Rural Population in Selected Developing Regions.....	5
4. Association between Total Factor Productivity Growth and Change in Share of Labor Force Engaged in Farming in Selected Countries	6
5. Association between Agricultural Total Factor Productivity Growth and Labor Productivity in the Non-agricultural Sector	7

ACRONYMS

AFS	agri-food systems
FTE	full-time equivalent employment
FTF	Feed the Future
GDP	Gross Domestic Product
LSMS	Living Standards Monitoring Surveys
MSMEs	micro and small enterprises
S4YE	Solutions for Youth Employment consortium
SME	small and medium enterprise
SSA	Sub-Saharan Africa
STRYDE	Strengthening Rural Youth Development through Enterprise Programme
TVETs	Technical and vocational education and training programs
USAID	United States Agency for International Development
USDA TFP	United States Department of Agriculture Total Factor Productivity
YBI	Youth Business International

1. BACKGROUND

As part of broader efforts to address major global challenges—such as climate change, urbanization, gender equality, and nutrition—Feed the Future, the U.S. Government’s global hunger and food security initiative, hosted a series of Roundtable Discussions in early 2016. These meetings brought together a diverse set of specialists to identify new emerging issues and strategies for effectively achieving the new Sustainable Development Goals (SDGs). Toward this end, Feed the Future assembled 44 academics and representatives of African governments, field-based youth programs, and development organizations on May 17, 2016 in Washington, DC for the Youth & Employment Roundtable Symposium. This report summarizes the evidence and discussion presented at this Roundtable, with a particular focus on youth livelihoods and employment and implications for the development of food systems in Sub-Saharan Africa. We conclude by summarizing views expressed about emerging opportunities and challenges facing African governments associated with the huge influx of young people into Africa’s labor force and the broad strokes of a strategy that anticipates and responds to these opportunities and challenges.

2. SUMMARY

The world will experience unprecedented demographic shifts during the 21st century. The share of the world's population living in Sub-Saharan Africa (SSA) will have risen from 12% in 2015 to 36% in 2100. Africa will exert growing impact on the world economy, including the global food system, and this impact will be largely determined by young Africans between 15 and 35 years of age who now account for 55% of the region's labor force. Every year, roughly 11 million young Africans are entering the labor force. Under the most favorable projections, only a quarter of these new workers over the next decade will find wage jobs. Agriculture and the informal sector will need to absorb most youth into gainful employment or Africa and other regions of the world will face escalating challenges resulting from youth under-employment. Over the past 15 years, African governments that have effectively promoted farm productivity growth have enjoyed faster rates of poverty reduction, higher rates of labor productivity in the non-farm segments of the economy, and a more rapid exit of the labor force out of farming. Because the economies of most African countries still depend largely on the performance of agriculture, public investments in support of agricultural productivity growth will remain a crucial component of an effective youth employment strategy. Often considered more of a burden than a benefit, Africa's youthful workforce could open up a wide range of economic opportunities in farming, in the downstream stages of agri-food systems and in the broader non-farm economy with the right mix of policies and public investments toward agriculture.

3. EVIDENCE

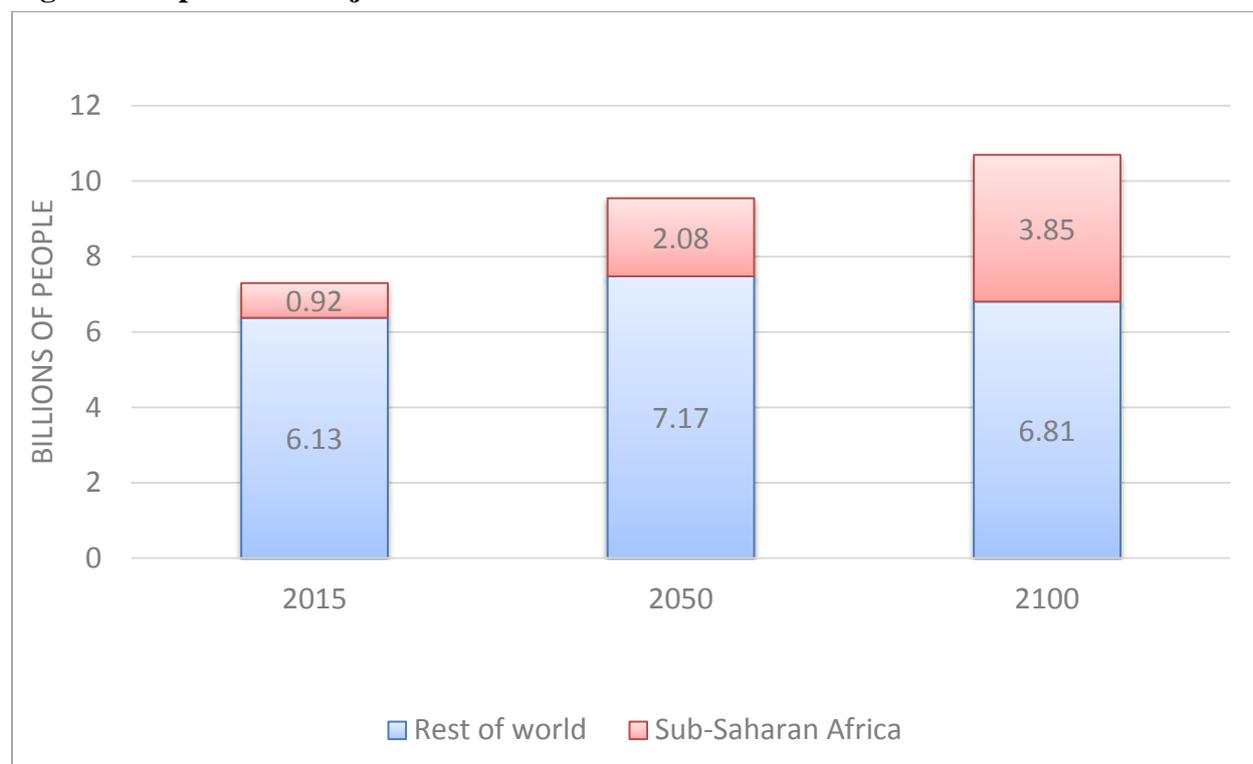
3.1. Population Trends

As of 2015, SSA accounts for some 950 million people, roughly 12% of the world's population. This share will nearly double to 22% by 2050 and to 36% by the end of this century as the region's population is projected to quadruple to roughly 4 billion people (Figure 1). As SSA accounts for a rising share of the world's population, African affairs will increasingly affect other areas of the world—economically, politically, demographically, and culturally.

SSA is the only region of the world where the population of rural people, and rural youth in particular, will continue to grow past 2050 (United Nations 2016). Sixty-two percent of Africans are below the age of 25. In most of Asia and Latin America, rural populations are declining as many young people migrate to cities (World Bank 2009).

The region's rapid population growth is driven by expected rising life expectancy and declines in death rates, particularly of children, and incorporates the effects of expected lower fertility rates, especially among educated urban women. However, compared to other regions of the world that have largely completed a demographic transition, Africa is experiencing only a slow decline in fertility. While child mortality rates have declined, fertility rates have remained high, leading to the *youth bulge* that the region is now experiencing (Filmer and Fox 2014; Canning, Raja, and Yazbeck 2015).

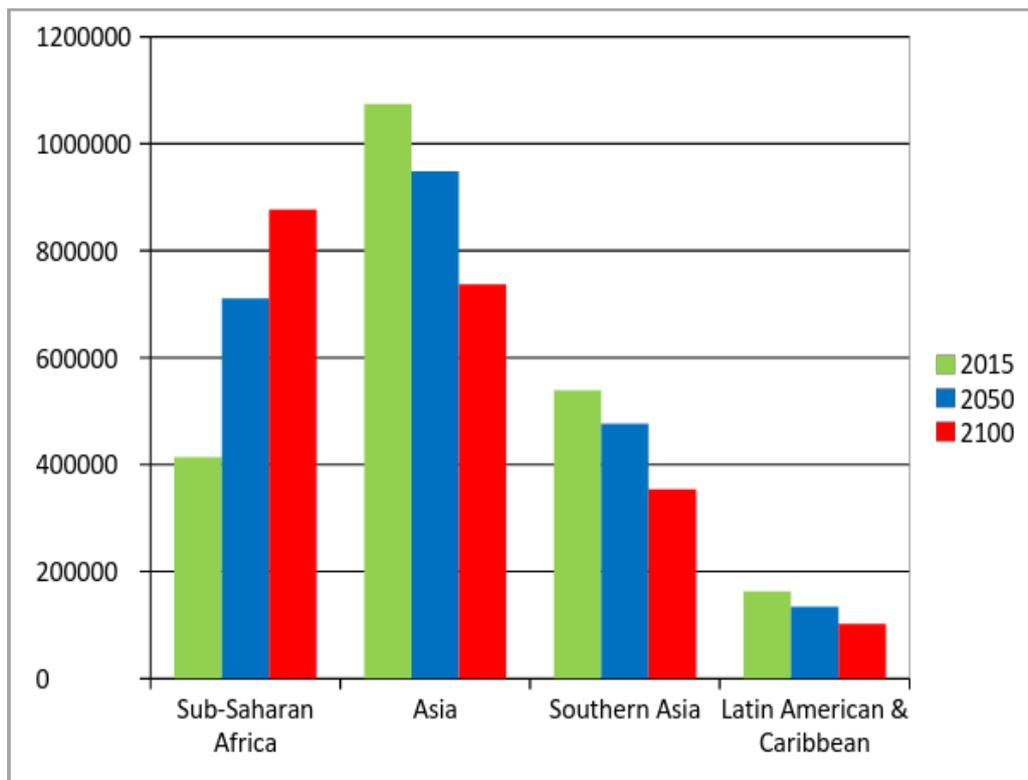
Figure 1. Population Projections for Sub-Saharan Africa and the Rest of World



Source: United Nations (2016, mid-year projections, as of the 2014 Revision).

Notes: The estimated population for SSA was 12.3% of the world's population in 2015, and is projected to comprise 21.7% in 2050 and 36.0% in 2100.

Figure 2. Projected Population Aged Less Than 15 Years



Source: United Nations 2016.

Notes: SSA is estimated to comprise 18.3% of the world's developing region population below the age of 15 in 2015. This fraction is projected to rise to 31.3% in 2050, and 42.6% in 2100 (Das Gupta 2016).

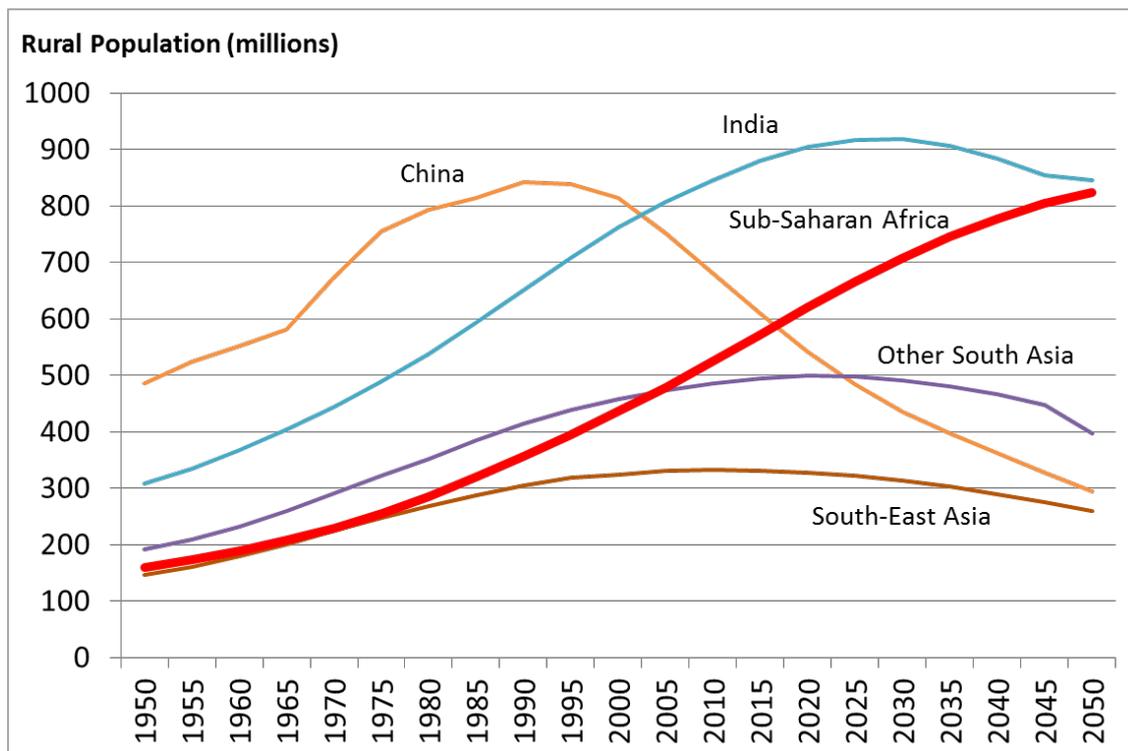
As of the 2015 United Nations (UN) medium-variant projections, Africa is the only region of the world where the population of under-15s is continuing to grow (Figure 2). Africans between 15 and 35 years of age now account for 55% of the region's labor force. Every year, roughly 11 million young Africans are entering the labor force.

3.2. Rural Population Growth and Migration

Another salient demographic trend is that SSA's rural population will continue to grow between 2015 and 2050 unlike any other region of the world (Figure 3). Rural Africa is expected to have nearly 60% more people in 2050 than it has today, fueled by the African youth bulge noted above and by the under-appreciated importance of rural-to-rural migration in much of Africa (Bilsborrow 2002; Lucas 2015). Between 2009 and 2013, for example, of all the Tanzanian youth between 15 and 25 years of age who migrated away from their rural home, 68% of them migrated to another rural area (Wineman and Jayne 2016). At the same time, migration patterns across the region appear to vary widely across countries (Potts 2012).

Youth migration is driven by both *push* and *pull* factors that either push youth out of areas due to lack of opportunities or pull them into different areas in search of improved livelihoods. The governments of Kenya, Rwanda, and Senegal are planning or attempting to create new primary cities with the construction of urban infrastructure to provide additional pull factors to formerly rural areas. In Nigeria and Zambia some data indicate urban-to-rural

Figure 3. Trends in Rural Population in Selected Developing Regions



Source: Prepared by authors using data in United Nations 2016.

reverse migration as mineral commodity prices fall, pushing youth out of resource-based urban jobs, though little comprehensive evidence is available to generalize. Participants noted that labor mobility is a means of enabling people to improve their opportunities (e.g., de Brauw, Mueller, and Lee 2014). In some areas of Tanzania, for instance, rural-to-rural and rural-to-middle (small city/town) migration accounts for greater poverty reduction than does rural-to-primary city migration (Christiaensen, De Weerd, and Todo 2013). Therefore, while labor mobility is to be encouraged, it is possible that more effective agricultural growth strategies might generate dynamism and improved livelihoods in rural areas that slow the rate of outmigration from rural areas.

3.3. Agricultural Productivity Growth and Shifts in the Labor Force

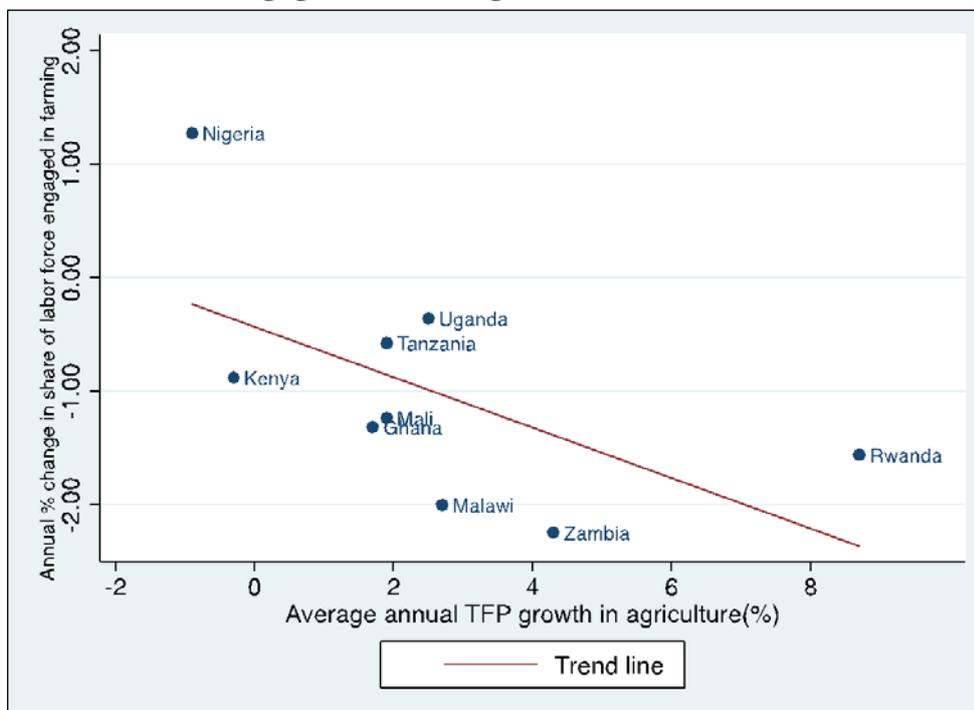
Rapid population growth is projected to affect the region's agricultural sectors in several important ways. First, rapid population growth will put rising pressure on African food systems to feed its burgeoning cities. Second, median farm sizes in densely populated areas of Africa will continue to shrink as they have for the past several decades (Headey and Jayne 2014). Third, and consequently, fewer young people can expect to inherit land, causing migration and demographic and labor market shifts that are already well underway in relatively densely populated rural areas, but not yet in others. Fourth, we are already seeing rising land values and the rapid development of land markets, especially in areas of favorable market access, as more people seek land not only for farming but for housing and other non-farm purposes.

African agriculture has shown remarkable but geographically uneven improvement compared to its precarious state 15 years ago. African governments that have invested in their agricultural sectors are reaping the benefits—stronger economic growth, declining poverty rates, and better nutritional status (Badiane, Benin, and Makombe 2016). Cross-country

econometric evidence shows that African countries experiencing the most rapid rates of agricultural productivity growth over the past 15 years have also enjoyed the greatest rates of non-farm labor productivity growth and the most rapid exit of the work force out of farming (Yeboah and Jayne 2016, see also Figures 4 and 5). Such evidence indicates that the expansion of job opportunities in the overall economy will be greatly affected by government policies and programs affecting the rate and inclusivity of productivity growth in farming. Agricultural productivity growth, especially if broadly based, will generate strong multiplier effects that expand job opportunities in the downstream stages of the agri-food system and in the broader non-farm economy.

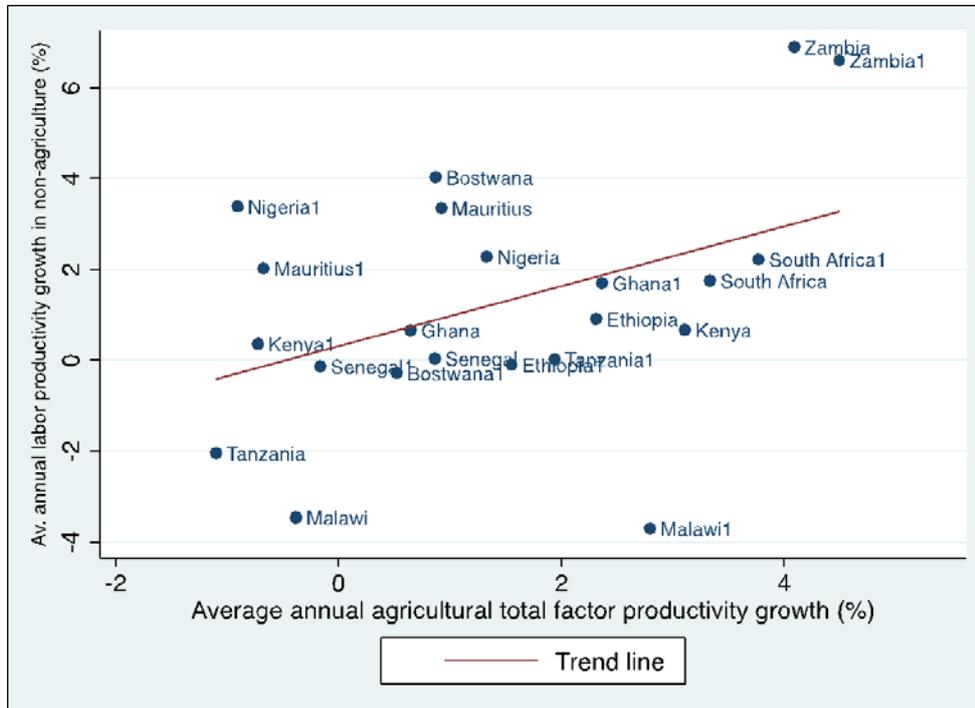
Burkina Faso provides a striking case highlighting the diverse ways in which productivity gains in staple crops alone can profoundly affect youth livelihoods. Burkina Faso has benefited in recent years from new cereal crop varieties produced by their national agricultural research system and extended to millions of smallholder farmers through extension programs. Cereal yields (mainly maize and rice) doubled between the 1990-95 and 2010-2014 periods (FAOSTAT 2016). This enabled farmers to produce their households' staple food needs on less land, thereby freeing up land and labor for other income earning activities including the growing of fodder crops that have over time replaced the transhumance system of sending livestock herds away during the dry season to a more intensive year-round raising of livestock locally. The ability to integrate fodder crops into the

Figure 4. Association between Total Factor Productivity Growth and Change in Share of Labor Force Engaged in Farming in Selected Countries



Source: Yeboah and Jayne 2016. Changes in the share of the labor force engaged in farming are derived primarily from Living Standards Monitoring Surveys (LSMS) national data sets described in Yeboah and Jayne (2016). Mean annual agricultural TFP growth rates are from United States Department of Agriculture Total Factor Productivity (USDA TFP) dataset (Fuglie 2015); the time periods for computation of TFP growth rates are lagged two years relative to the dates of the LSMS surveys. Spearman Correlation coefficient = -0.69, prob > |t| = 0.04.

Figure 5. Association between Agricultural Total Factor Productivity Growth and Labor Productivity in the Non-agricultural Sector



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 (<http://www.rug.nl/research/ggdc/>) employment data for corresponding periods. 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 = 0.37, prob > |t| = 0.09.

farming system has allowed for more permanent tending of livestock, providing regular dairy income for many households, improved nutrition resulting from the year-round supply of dairy products, and the ability to collect manure for reintegration of organic matter back into the cereal fields, thereby improving soil quality, improving crop response to inorganic fertilizer and contributing further to sustainable agricultural intensification. In these various ways, the success of Burkinabe crop science and associated investments resulting in cereal yield growth has transformed the integrated cereal-legume-livestock systems in ways that have promoted sustainability and resilience, improved nutritional outcomes, greater profit opportunities for youth in farming,¹ and greater multiplier effects from agricultural growth on job growth in the off-farm economy. In countries where the national economy still depends largely on the performance of agriculture, public investments in support of agricultural productivity growth will remain a crucial component of an effective youth employment strategy.

3.4. Urbanization and Urban Population Growth

Population is also growing rapidly but at a highly variable pace in Africa’s urban areas. Over the past decade or two, about one-third of African countries have been experiencing either no significant urbanization or even de-urbanization (Bocquier 2005; Potts 2012). However, there

¹ According to IFAD (2016), agricultural value added per worker in constant USD rose by 42% between 1990-1994 and 2010-2014 (page 368).

is no doubt that urban populations are rising rapidly, some of them in mega-cities, but mainly in secondary cities and tertiary towns in areas formerly considered rural.

Urban population growth has several important implications for African agri-food systems. First, rapidly growing urban-based demand for food will provide great incentives for private firms to invest in food supply chains (Richards et al. 2016). Income growth in Africa's cities is also influencing dietary patterns and expanding the demand for food processing and value addition in agri-food systems (Tschirley et al. 2015). Supply chains for domestically sourced foods will be increasingly focused on secondary and tertiary cities for food processing and manufacturing (Reardon 2015; Richards et al. 2016). The region is also becoming more dependent on global markets for the major cereals, oilseeds, and animal products, resulting in a situation in which most foods in African cities are priced at import parity. As new towns spring up in former hinterland areas and as agricultural value chains develop, African farmers are enjoying more favorable market access conditions than they used to (Chamberlin and Jayne 2013; Richards et al. 2016; Oehmke et al. 2016). Improved market access conditions combined with relatively high food prices provide unprecedented opportunities for Africa's farmers and value chain actors. If governments nurture a conducive policy environment, this evolving situation may bode well for youth livelihood options in the agri-food system, and in farming in particular.

3.5. Shifts in the Rural Labor Force to Non-Farm Employment

While substantial differences across countries warrant caution against overgeneralization, the past decade witnessed a sharp increase in the rate at which Africans are exiting farming in favor of off-farm activities (Table 1) and the rate at which smallholders are combining on-farm and off-farm employment within the same household. Within the off-farm sector, the greatest number of new jobs for youth is in the off-farm informal sector, particularly construction, commerce, and manufacturing. Off-farm jobs in the agri-food system are also growing rapidly in percentage terms, but from a low initial base. The opposite is true of farming; it is growing relatively slowly in percentage terms but because such a high proportion of the region's labor force is engaged in it, farming has accounted for roughly two to four times more new jobs over the past decade than the downstream stages of the agri-food system (Yeboah and Jayne 2016). While there are a few important exceptions such as Ghana and Zambia, farming will continue to provide the greatest number of new jobs being created in most African countries at least for the next decade or more (Filmer and Fox 2014; Losch 2012; Yeboah and Jayne 2016).

Several LSMS data sets show particularly strong entry into farming among older people in urban areas, reflecting the rise of urban-based entrepreneurs, civil servants, and retirees to invest in farming later in life (Jayne et al. 2016). These landowners and investor farmers may provide opportunities for their children to engage in relatively capitalized forms of agricultural production on a larger scale than the vast majority of smallholder farmers do today.

Also, labor migration does not necessarily refer to a physical movement of people, or a binary switch out of farming to non-farm activities. Individuals may remain in rural areas, but progressively shift their labor from farm to off-farm activities over time (e.g., Reardon 2015; Richards et al. 2016). In fact, Yeboah and Jayne (2016) show a drastic decline in farming's employment shares over time when jobs are weighted by the total amount of time an individual devotes to it relative to computations based on simple counts of jobs (Table 1).

Table 1. Changes in the Share of Total Jobs among the Working Age Population (15–64 Years) in Farming, in Off-Farm Jobs within Agri-Food Systems (AFS), and in Non-Farm Jobs (Non-AFS)

Country	Survey years	Total # of jobs in millions	Farming		Off-farm within AFS				Off-farm outside AFS	
			% of jobs	% of FTE jobs	Agro-processing		Downstream commerce and distribution		% of jobs	% of FTE jobs
					% of jobs	% of FTE jobs	% of jobs	% of FTE jobs		
Ghana	2005/06	10.1	52.1	43.5	7.5	6.3	7.1	8.6	33.3	41.6
	2012/13	13.9	43.6	34.3	3.7	3.7	13.8	15.5	38.9	46.5
Nigeria	2010/11	62.3	37.0	30.6	2.6	2.3	16.1	18.7	44.4	48.2
	2012/13	69.7	42.1	33.7	4.8	4.6	16.2	18.6	36.9	43.1
Rwanda	2005/06	6.1	75.2	65.7	0.4	0.4	6.5	7.4	18.0	26.6
	2010/11	9.1	67.4	54.0	1.1	1.2	5.7	7.7	25.9	37.0
Tanzania	2010/11	18.4	59.0	47.3	1.7	2.5	12.5	15.0	26.8	35.2
	2012/13	20.4	58.7	48.3	1.5	1.6	12.5	15.6	27.3	34.5
Uganda	2005/06	10.8	72.6	57.0	2.1	2.8	5.7	10.2	19.6	30.0
	2011/12	15.9	67.1	48.6	2.8	1.7	6.6	12.0	23.5	37.7
Zambia	2005	4.7	73.8	61.2	1.2	1.6	1.9	3.1	23.1	34.1
	2012	5.3	60.4	46.7	1.6	2.1	4.9	7.1	33.2	44.1
Kenya [~]	1999	11.1	54.4	-				45.6		
	2009	14.2	45.6	-				54.4		
Malawi [~]	1998	1.9	73.3	-				26.7		
	2008	2.0	53.9	-				46.1		
Mali [~]	1998	2.0	79.6	-				20.4		
	2009	2.6	64.2	-				35.8		

Source: Yeboah and Jayne (2016), computed 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; Nigeria General Household surveys. ~ Kenya, Malawi and Mali results are from population and housing census data in Integrated Public Use Microdata Series, <https://www.ipums.org/>.

Notes: FTE: full-time equivalent employment; ~ the census data used to compute results for Kenya, Malawi and Mali did not permit disaggregation of off-farm jobs into various categories; agri-food systems jobs reported in the table include those in input supply, extension, trading of agricultural products, processing, preparation of foods away from home, etc. For details, see Yeboah and Jayne (2016).

Their observation reflects the seasonal nature of farming but also attests to the extent to which farming is increasingly becoming a part-time activity for many Africans as opportunities for off-farm employment (particularly during those periods when farming jobs are unavailable) expand in the economy, rather than a widespread complete abandonment of farming.

Use of labor-saving technologies such as herbicides and mechanization have been increasing in many areas (Diao et al. 2014; Grabowski and Jayne 2016), and efforts to generate more productive labor-saving techniques in farming and in the agri-food system are likely to be an important priority of adaptive agricultural research and extension systems, public and private.

3.6. Youth and Entrepreneurship

Governments and donors are keenly interested in promoting youth entrepreneurship in developing countries, as formal sector employment opportunities are not being created quickly enough to absorb large numbers of secondary and tertiary level graduates. Creation of micro and small enterprises (MSMEs) by youth is currently a means of generating employment, though many such MSMEs are one or two person enterprises with limited resources, access to finance, and technical knowledge. Many young people in developing countries state that they would rather create businesses and work for themselves, however, than work for others (Kew et al. 2013). So youth entrepreneurship is an important dimension of employment generation—for both agro-entrepreneurs and youth they hire. However, to realize these opportunities, there is an urgent need to better assess the required skill needs, the capacity of existing public and private sector organizations to provide these skills to young people, and the effectiveness of alternative development assistance programs needed to accelerate youth acquisition of these skills.

As discussed in “Toward Solutions for Youth Employment: A 2015 Baseline Report,” of the Solutions for Youth Employment (S4YE)² consortium, youth entrepreneurship (*and entrepreneurship at any age*) will depend on broader public policies such as macroeconomic stability, labor market and regulatory policies, and public investments such as well-functioning infrastructure and financial systems for financing businesses. These preconditions are still in need of major improvement in most SSA countries. Noting that 89% of new work is in the informal sector in developing countries, this report observes (page 17): “We do not yet understand the precise institutional and policy factors that allow young people in some countries to thrive, while others suffer. And we are just learning what institutional and policy reforms can improve outcomes for youth in contexts of low economic growth or weak government capacity.”

A central objective of S4YE is to collect and analyze evidence of which targeting programs, policy and institutional strengthening efforts, and educational innovations work most effectively in generating youth employment and entrepreneurship.

3.7. Entrepreneurship (and Technical) Training

Investments in improving basic education, particularly literacy, numeracy, and problem solving ability, will have a long-run payoff in lower income countries, where educational systems are often weak and emphasize rote learning. Public and private investments in secondary and post-secondary education can also impart general small and medium enterprise (SME) management skills and financial literacy, as well as more specialized training in agro-enterprise and farm management skills, and innovative production practices, for firms and farms in specific value chains. Technical and vocational education and training programs are often advocated as a practical alternative to conventional secondary and post-secondary education in order to train youth in agro-enterprise management and operations, as well as other technical and business fields. It is not yet clear, however, if such a supply-side approach has a significant impact on youth entrepreneurship.

² S4YE is a partnership initiated by the World Bank, Plan International, the International Youth Foundation, Youth Business International (YBI), RAND, Accenture, and the International Labor Organization. See the full report at: https://www.s4ye.org/sites/default/files/Toward_Solutions_for_Youth_Employment_Full.pdf

STRYDE: A Promising Innovative Program in East Africa Worth Monitoring and Evaluating

STRYDE, the Strengthening Rural Youth Development through Enterprise (STRYDE) program, is a partnership between TechnoServe and the MasterCard Foundation, whose first phase ran from 2011 to 2015. It targeted some 15,000 rural youth in Kenya, Rwanda, Uganda, and Tanzania in an intensive program beginning with three months of training in soft and entrepreneurship skills, followed by a nine-month program that includes business mentorship and counseling from a youth trainer, employment linkages, and linkage to financial institutions. STRYDE also uses business plan competitions (where winners receive awards), job fairs with local businesses to create demand for program graduates, and dissemination of knowledge across the region, where stakeholders share best practices. As of 2015, TechnoServe reported 30% of the participants were running micro- and small enterprises, 37% were farming, 11% found wage employment, and 6% had returned to school (<http://www.technoserve.org/our-work/projects/STRYDE>). STRYDE 2.0 continues this program through 2019 in a \$25.9 million partnership to generate increased income and economic opportunities for another 48,000 young people in rural East Africa (<http://reports.weforum.org/disrupting-unemployment/strengthening-rural-youth-development-through-enterprise-programme-stryde/>). While the cost per enterprise created may seem high on first examination, it is likely that STRYDE has significant indirect benefits by demonstrating to youth who are not part of the program that there are unexploited opportunities to be seized. Furthermore, the program graduates who successfully create businesses hire other youth to work for them. Even graduates who do not create their own enterprises can become productively employed in SMEs and larger firms (whether owned/managed by youth or not).

Roundtable participants addressed the demand side in noting the need to engage prospective private sector employers and mentors in shaping agri-food system curricula, and providing internships and practical training opportunities for students. Prospective employers seek soft skills (an ability to work collaboratively in teams), numeracy and literacy, and specific technical knowledge needed to work effectively in agro-enterprises. These skill sets are important for both youth as employees in agro-enterprises and other SMEs, and as creators and managers of their own MSMEs.

In a recent paper by Ahmed et al. (2016), the authors demonstrate through constructing alternative scenarios that improving the quality of education could be a contributing factor to accelerated productivity growth, increased investment, broader economic growth, and faster poverty reduction in SSA from 2015 to 2030. An enhanced human capital effect will help realize the potential of a demographic dividend in SSA from youth entering the labor force in large numbers during the coming years. While Ahmed et al. (2016) estimate the potential impacts of improved education programs and skills development of the African labor force on Gross Domestic Product (GDP) and poverty reduction aggregates, their analysis does not focus on the specific types of interventions that would be most cost-effective in enhancing work force skills among youth.

3.8. Policy and Regulatory Constraints to Youth Entrepreneurship

As an asset-poor group with limited access to finance, land, and business development services, youth in developing countries are at a big disadvantage in creating agro-enterprises.

The often-cited legal and regulatory barriers to creating and operating businesses, which are the focus of Doing Business and Enabling the Business of Agriculture indicators, represent even more of a constraint to entry for youth than they do for adults with (generally) more assets, practice in navigating complex regulatory environments, and business experience. The more difficult and costly it is for youth to create and run formal enterprises, the higher the probability that youth will create informal micro-enterprises that lack the resources (land title especially; access to water and power) and access to finance to grow and employ other youth. This suggests that streamlining of regulations affecting agribusinesses could significantly benefit youth. Whether specific and targeted policies and regulations could also facilitate youth entrepreneurship requires further applied research. Facilitating youth access to resources and finance are key areas for investigation, innovation, and experimentation.

3.9. Diversification and Entrepreneurship

As Feed the Future (FTF) and other donor programs expand agricultural productivity in low-income countries, this will spur MSME creation by youth and women. There will be opportunities for MSMEs to assemble agricultural surpluses in rural areas, provide transport and post-harvest handling services (including sorting and grading, packing, storage, and drying), and do first-stage processing. Going forward, FTF could track growth in productivity, farmer sales, movement of surplus staple foods to towns (and across borders), MSME creation and employment, and the use of contracting (by buyers, such as larger-volume wholesale traders or processors).

Also noted by Roundtable participants is that diversification into livestock, horticulture, tree crop and other higher value agricultural production will generate employment for youth and entrepreneurship opportunities. These value chains require labor-intensive production and post-harvest handling practices, which will benefit youth as producers and as entrepreneurs and employees in agri-food systems. Diversification-related opportunities for entrepreneurs will also emerge in input distribution and associated services, irrigation techniques and water harvesting/storage methods, alternative power generation, and other business development services. Conference participants noted the need for caution in extrapolating trends from LSMS data drawn from periods with high incidence of caloric and nutritional undersupply among significant percentages of the population. African diets are becoming increasingly diversified and households are spending more on food. Therefore, significant shifts may be in store for agri-food systems, especially in how the post-harvest stages operate, and considerable uncertainty yet remains as to the details of those shifts and the implications for future job creation.

4. POLICY IMPLICATIONS: ADDRESSING THE NEEDS OF RURAL YOUTH

Despite the positive growth in agricultural productivity in Africa in the past decade, there is still much to do, especially for countries that have not adequately invested in their smallholder farmers or rural job creation. Many of the actions that governments need to take are well understood and backed by strong evidence. These include, for example, investing in physical infrastructure, agricultural research and extension, creating enabling environments for rural entrepreneurship and business creation, education, health and inclusive growth policies that provide economic incentives and opportunities for millions of rural people (Economist Intelligence Unit 2008; Fan, Gulati, and Thorat 2009; Badiane, Benin, and Makombe 2016). Implementation is now the priority.

4.1. Youth and Farming

Considerable debate centers on the employment aspirations of young people. Over the course of the 21st century, it is likely that Africa will follow the same pattern seen in the rest of the world whereby the share of the work force in farming gradually declines as the economy grows and diversifies. However, this trend does not necessarily mean that the role of agriculture in the region's economic transformation process is receding. To the contrary, the performance of agriculture is likely to play a decisive role for at least the next several decades, as it does currently, in influencing opportunities and livelihoods in both the agri-food system and the broader non-farm economies.

Most African rural youth today grow up on small-scale farms of two hectares or less with several other siblings who may need to be considered in family land bequest decisions. While youth inheritance of land at the time that they are ready to form a family has been a historical birthright of young men (women in matrilineal areas) in Africa, rising land scarcity has changed things radically for the current generation. Parents are living longer and may not be ready to bequeath land to their children until the children are in their 40s. Median farm sizes continue to decline as they have for the past 50 years in the relatively densely populated rural areas of Africa. In light of these circumstances, a high proportion of parents have guided their children to seek non-farm employment and have attempted to equip them for success by sending them to school. Today's African youth possess an unprecedentedly high number of years of education compared to previous generations,³ but governments' efforts to accommodate rising demand for education have often been accompanied by deteriorating teacher quality as well as a failure to upgrade curricula to reflect 21st century needs (Filmer and Fox 2014). In addition, government expenditure in support of agriculture has often focused on emergent and larger farms rather than small-scale farms (Binswanger, Deininger, and Feder 1995). In this environment, it may be no wonder that many youth are leaving farming. Evidence from Ethiopia and Tanzania indicates that the likelihood of youth outmigration from their rural homes is inversely related to land productivity, the size of their parents' farm and parents' agricultural assets, and positively associated with the number of siblings in the household (Bezu and Holden 2014; Mdoe et al. forthcoming).

³ For example, Ethiopia produced 3,000 university graduates in 1995 compared to over 100,000 in recent years (Wubeneh Nega. Ethiopian Agricultural Transformation Agency and Alliance for Green Revolution staff, personal communication, September 23, 2016. Addis Ababa).

4.2. Skills Required by Youth in Emerging Agri-Food Systems

Participants observed that youth will require a combination of technical skills, business skills and *soft* behavioral skills (problem solving, organizing and planning, working in teams, etc.) relevant to farming and the broader agri-food system. Participants noted that training and skills development should be considered all along the value chain (not just in farming) and may include technical vocational education and training, private sector programs that infuse the needs of prospective employers and entrepreneurs into apprenticeships, lifelong learning programs, and improvements of the formal educational system, which was noted to be very weak in many rural areas globally, but especially in SSA. Youth are very open to accessing various forms of information involving ICTs, which could speed innovation. Improving skills may help increase earning potential, improve health and wellbeing, and vice versa.

Participants discussed the importance of policies and the enabling environment in promoting youth livelihoods in the agri-food system and the broader economy. Access to improved laborsaving technologies, finance, electricity, other forms of physical infrastructure and land are particularly important, especially in light of increasing land scarcity in densely populated areas. Land rental markets are likely to be an increasingly important pathway for young people with limited resources to enter into farming, while those with money may be able to rely on land sales markets and pursue more capital-intensive forms of production.

The future will also place increased emphasis on production-based activities that raise the returns to labor, such as horticultural crops, poultry, dairy and other animal products, and export cash crops where suitable. Labor saving technologies can free up more time for individuals to also participate in value-added activities in the agri-food system (tractor or animal traction rental services, processing, preparing foods for purchase away from home by workers), agri-input manufacture and distribution, and the provision of services to support farmers (public and private research and development, extension and soil testing services, etc.). Technologies and practices that save labor (mechanization, herbicides) will be increasingly important because they will allow rural people to spend more time in diversified off-farm activities that enable them to raise their total incomes. Broader utilization of technology that replaces tedious manual labor may raise youth incentives to engage in farming.

Many small farms will need to shift to higher-return activities such as fresh fruits and vegetables, dairy and other livestock, and cash crops, which will require access to knowledge, capital, and finance. It will also require an effective rural food market system so that cash crop smallholders can afford to purchase nutritious foods. There will be increasing opportunities for youth employment in value chains and food industries in most developing areas, particularly secondary and tertiary cities. Non-farm jobs are growing rapidly in all regions of the world, but the rate of growth of non-farm jobs is likely to depend importantly on multipliers from agri-food system growth in countries still in their early stages of development. Strategies that effectively raise the returns to labor in farming and the entire agri-food system will be among the most important steps that African governments can take to improve youth livelihoods, especially for women.

4.3. Evolving Role of Agriculture in Expanding Youth Livelihoods

Agriculture is widely viewed as unattractive to youth, but to a large extent, this may reflect historically low profitability in developing areas, due in part to frequent emphasis on staple food crops rather than cash crops. Participants stated that the key to making agri-food system jobs more attractive to youth is to make agriculture more profitable. Participants discussed

the importance of government policies and the enabling environment in promoting youth livelihoods in the agri-food system and the broader economy. Access to finance, electricity, other forms of physical infrastructure and land are particularly important, especially in light of increasing land scarcity in densely populated areas.

While most young Africans aspire to work in non-farm businesses, the pace at which such jobs are being created is outstripped by the number of young people entering the labor force—currently estimated at roughly 11 million per year (Filmer and Fox 2014). The simple arithmetic, therefore, makes it clear that most young Africans will still need to be primarily—or at least partially—engaged in *farming*. While young farmers may wish to put down their hoes and walk into office jobs, this can happen only as fast as non-farm job opportunities arise and with major improvements in the quality of African education systems. Rapid employment growth in the non-farm economy does not arise spontaneously. When most of a country's population starts out primarily in farming, agricultural productivity growth is generally necessary to generate transformative income growth and money circulating in rural areas to stimulate the growth of non-farm goods and services.⁴ Over time, the gradual shift of the workforce from farming to non-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 to this structural transformation process. As food supply chains become more complex, technical organizational improvements both on the farm and through the food supply chain become increasingly important. Fortunately, these growth processes are now clearly visible in much of SSA.

⁴ Lipton (2005) notes that, except in the cases of a handful of city-states, there are virtually no examples of mass poverty reduction since 1700 that did not start with sharp rises in employment and self-employment income due to higher productivity of small family farms.

5. CONCLUSIONS AND NEXT STEPS

Governments in developing countries, international development partners, and non-governmental organizations are all seeking to better understand how to harness the energy and potential of youth in developing countries. The challenge and opportunity for the global community is to capitalize on expanding youth populations to achieve food security and energize economies. Youth are willing to experiment and innovate. Their potential roles and aspirations in shaping 21st century food systems are not yet fully understood. Participants stated that youth voices need to be heard in dialogues on their roles in agri-food system development strategies. Strengthening the competitiveness and efficiency of agri-food systems, improving the policy-enabling environment, expanding their access to finance, and improving the education and skill sets of youth were widely acknowledged to represent the foundations of an effective strategy for achieving potential youth dividends. The participants noted that more experimentation and evidence are needed on effective approaches for engaging youth in agriculture and enhancing their contribution to broader post-2015 societal goals. Moreover, the needs of youth are diverse based on their gender, education and the conditions in which they live. Youth live and work in environments ranging from fragile and remote (where migration may be the best option) to high-potential and well connected areas that can provide high returns to farming for youth who can acquire land, and to urban areas where education and soft skills pose the greatest barriers to a viable livelihood.

African governments would be well served to adopt a triple-pronged strategy: First, focus on investing in agricultural productivity growth to create new opportunities for youth in farming and generate the multiplier effects that expand the number of job opportunities for youth in the broader off-farm economic system. Second, invest in education and skill development to enable young people to derive more money and satisfaction from the opportunities that arise. This means redoubling public investments in basic, secondary, and tertiary education, vocational and technical training, and soft skills (Filmer and Fox 2014). However, more research is urgently needed to determine what forms of education and skill training provide the greatest payoffs to young people, recognizing that the answers are likely to differ across Africa given wide differences in economic conditions. Third, increase investment in programs that allow women greater control over the number of children they have, thereby enabling labor force trends to better reflect women's preferences about family size, rather than being largely out of their control. U.S. and international development assistance has an important role in helping African governments to bring all three of these strategies into fruition.

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