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USAID Bureau for Resilience, Environment, and Food Security (REFS)

Youth in Agri-food Systems Learning Activity

Literature Review

December 1, 2023

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By Christine Allison and Sarah Mattingly, Consultants for Making Cents International

USAID's YouthPower2: Learning and Evaluation (YP2LE) generates and disseminates knowledge about the implementation and impact of positive youth development (PYD) and cross-sectoral approaches in international youth development. We are leading research, evaluations, and events designed to build the evidence base and inform the global community about how to transition young people successfully into productive, healthy adults.

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Acronyms and Abbreviations

CBT	cognitive behavioral therapy
CCIR	cross-cutting intermediate result
FAO	Food and Agriculture Organization of the United Nations
FTE	full-time equivalent
GDP	gross domestic product
GFSS	Global Food Security Strategy (United States)
ICT	information communications technology
ILO	International Labor Organization
MSME	micro, small, and medium enterprise
ODI	Overseas Development Institute
PSE	private sector engagement
PYD	positive youth development
R&D	research and development
SDG	Sustainable Development Goal (United Nations)
SSA	sub-Saharan Africa
TVET	technical and vocational education and training
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization
WINGS	Women's Income Generating Support
Y2PLE	YouthPower2: Learning and Evaluation
YASLA	Youth in Agri-food Systems Learning Activity
YOP	Youth Opportunities Program

Executive Summary

Like its predecessor covering the 2017-2021 period, the U.S. Government Global Food Security Strategy (GFSS) 2022-2026 documents a whole-of-government strategy and implementation plan to sustainably reduce global hunger, malnutrition, and poverty. To implement the GFSS, the United States Agency for International Development (USAID) leads Feed the Future, the U.S. government's global hunger and food-security initiative, and coordinates with partner agencies. Since its inception, the GFSS has outlined the broad objectives of inclusive and sustainable agriculture-led economic growth, strengthened resilience among people and systems, and a well-nourished population, especially among women and children. It has also articulated areas of emphasis and action, including for equity and inclusion, climate change and working across the food system, among others. The GFSS further considers cross-cutting intermediate results (CCIRs) to be foundational to the achievement of all GFSS objectives, including Increased Gender Equality and Female Empowerment (CCIR 2), and Increased Youth Empowerment and Livelihoods (CCIR 3).

Youth are thus a central focus of the GFSS, as diverse youth needs, roles and circumstances influence the achievement of GFSS objectives, and vice versa. The majority of Feed the Future priority countries are experiencing rapid population growth[1] that increases pressure on natural resources and the demand for nutritious food and diverse services, as well as for the rapid creation of more and better jobs. At the same time, youth are at ages and stages in life from early adolescence through the transition to adulthood when they are experiencing profound and often precarious biological, cognitive, psychosocial, emotional and other changes. Inclusive and sustainable agriculture-led growth is understood to contribute to poverty reduction by increasing labor productivity and agricultural productivity in ways that deliver improved incomes and jobs. As countries undergo agricultural transformation and the structure of their economies change, work will change within agriculture and other sectors. Job quality will need to improve, and jobs will need to become more plentiful, inclusive, climate-resilient and contribute to greener outcomes. The GFSS puts forth that it is critical to consider who benefits from and drives these opportunities and that youth and women must be key participants.

Youth considerations are closely linked to a critical focus on gender, as gender divides deepen and widen across adolescence, with intergenerational implications. Access to and the ability to use resources productively differs due to age, life stage, gender and other factors. As stipulated by the International Labor Organization (ILO), poverty affects young people distinctly, with young workers twice as likely as adult workers to live in extreme poverty (living on less than US$1.90/day in purchasing power parity terms, ILO Department of Statistics 2018) and far more likely to be informally employed. Young women are in aggregate more likely than young men to be not in employment, education and training as well. As explored in The Lancet series of 2021 on Adolescent Nutrition, adolescence is also a critical time of accelerated growth, and addressing adolescent nutrition needs is a critical opportunity to interrupt intergenerational malnutrition.

To reduce poverty, aid agencies and academics alike have dedicated considerable effort and resources to understanding its root causes—and how best to address them. Recent evidence points to the critical role of inclusive and sustainable agriculture-led growth in poverty reduction, and through 2019, global poverty had been decreasing. Still, poverty rates persist globally, with some population segments worse off than others. According to the Global Employment Trends for Youth 2022 report from the ILO, young people were also disproportionately affected by the economic and employment consequences of the COVID-19 pandemic, with the pace of youth labor market recovery lagging behind that of older workers in many countries and regions. These situations raise questions about the evidence base for

[1] Youth aged 15 to 29 constitute a significant and growing proportion of the population in many USAID partner countries (28 percent in least developed and low-income country populations (authors' calculations utilizing data from the UN Department of Economic and Social Affairs 2021)).

what works in poverty reduction and whether it applies to everyone and for youth empowerment and livelihoods.

This literature review undertaken through the REFS Youth in Agri-food Systems Learning Activity (YASLA) examines the latest evidence on how GFSS objectives both contribute to poverty reduction and how they align with, complement, and, or operate at variance with the processes by which youth become healthy, engaged, productive adults in their societies, including in relation to their empowerment and livelihoods in agriculture and food systems. This literature review asks: What works in poverty reduction for everyone? How do youth become less poor? And how can youth contribute to poverty reduction? In assessing how investments in achieving GFSS objectives involve and impact youth, the literature review draws on five lenses of youth development (physiological, psychosocial, socioecological, economic and policy and systems), as well as concepts from positive youth development (PYD). Key findings, conclusions and recommendations are summarized here below and described in detail as follows.

Key Findings

The GFSS and Poverty Reduction

The GFSS objectives focus on four key conceptual and strategic areas that contribute to poverty reduction: (1) reducing inequality and increasing equity; (2) inclusive and sustainable agriculture-led growth, (3) strengthened resilience, and (4) a well-nourished population. Below, we introduce each area and highlight key findings on how the pursuit of each objective contributes to the GFSS goal of reducing poverty. Where relevant, we highlight youth-specific findings.

Reducing Inequality and Increasing Equity

Poverty is a complex phenomenon, and USAID recognizes that in any society, some people have more constraints on their economic choices than others. This inequality of opportunity drives intergenerational poverty as social conditions reproduce the same cycles that result in barriers for some groups and individuals. Breaking those cycles of reproduction requires inclusive, transformative approaches to achieve change at scale. As a critical approach to reducing poverty, therefore, the GFSS includes cross-cutting intermediate results on gender equality and female empowerment, and on youth engagement and employment. Equality[2] and equity[3] are important outcomes, and the evidence base yields key lessons on those as well.

- Determining how to define poverty and measure poverty reduction is a critical part of addressing inequality among heterogeneous youth (and other populations).
- Achieving a reduction in the incidence of extreme poverty, defined as those living below an international poverty line of $2.15/day (as updated in 2022 from $1.90 per day), does not necessarily eliminate malnutrition and hunger, and children and youth may suffer as households make choices about how to meet the needs of all members.

[2] Equality refers to the absence of discrimination in the allocation of resources or benefits or in the access to services. All human beings are free to develop their personal abilities and make choices without the limitations set by stereotypes or prejudices. Equality means that rights, responsibilities, and opportunities will not depend on personal characteristics or attributes.

[3] Equity means fairness of treatment for all, according to their respective needs. This may include equal treatment or treatment that is different but considered equivalent in terms of rights, benefits, obligations, and opportunities (e.g., equal treatment before the law, equal access to social provisions; education; equal pay for work of the same value). In the development context, an equity goal often requires built-in measures to compensate for the historical and social disadvantages. Specific measurements and monitoring are employed to ensure that, at a minimum, programs, policies, and projects implemented do not leave some individuals worse off than others in their peer groups and families and that measures are taken to compensate for historical and social disadvantages.

- Some of the causes of inequality in youth outcomes are severe stressors and trauma, sociocultural norms, and an unsupportive enabling environment for youth development based on one or more individual attributes (e.g., biased gender norms). Youth therefore cannot be treated as a homogenous group. While all youth may in some ways be at a disadvantage compared to adults, understanding the vulnerability factors youth face in specific contexts is an important part of engaging youth effectively and reducing poverty among young people.

Inclusive and Sustainable Agriculture-Led Growth

The first objective of the GFSS is inclusive and sustainable agriculture-led growth as a primary poverty reduction strategy.

- Increases in agricultural productivity contribute significantly to improved livelihoods among the rural poor, mainly smallholder farmers and small enterprises, including youth, women, and other marginalized groups.
- Strengthening labor productivity among youth and women (particularly young women) through improvements in education, training, and employment offers a significant opportunity to improve productivity in agriculture and other sectors as well.
- Growth in the agriculture sector can be two to three times more effective at reducing poverty than the same amount of growth in other sectors. Improvements in agricultural productivity creates two key conditions: (1) increasing wages/revenues among workers/producers in that sector, and (2) freeing up labor (particularly in subsistence and household production) to shift into more productive service or industry sectors. As the workforce shifts from agriculture to more productive sectors and gross domestic product (GDP) increases, however, the impact of growth in agriculture weakens as the differential in labor productivity decreases.
- The interdependency of economic sectors means that long-term growth and productivity gains in agriculture depend on the health of trade, transport, retail, and other sectors. Growth in the agriculture sector likewise supports growth in other sectors. For example, the existence or potential for an agricultural surplus drives infrastructure investment undergirding trade, transport and more.
- The key factors supporting productivity improvements in agriculture (and, thus, reducing poverty) are human capital (defined as knowledge, skills, and health that can be transformed into other tangible assets), more effective leveraging of existing technologies and practices, including new or expanded applications of an existing embodied technology (e.g., fertilizer), process (e.g., integrated pest management), or policy (e.g., trade policy, private sector enabling policy) including social policy (e.g., youth and gender roles), and innovations, which include research and development (R&D), new applications of effective practices (including inclusive market development approaches and asset accumulation among marginalized groups), and new technologies and approaches.
- Human capital improvements rely on healthy physical and physiological development (based on good nutrition, healthful choices for physical activities, and the absence of extreme stressors or trauma) and psychosocial and cognitive development processes, including the formation of reciprocal one-to-one and caring adult relationships and participation in the community through work and civic means (heavily influenced by sociocultural factors and the accessibility of such pathways).

- Some innovations in the form of technologies that improve overall productivity through higher yields or reduced costs require investments in infrastructure and R&D.[4] The literature identifies key areas for investment or subsidization, including mobile phone and internet connectivity, the digitization of food system processes, affordable and accessible irrigation systems, electrification, and, if targeted correctly, road and transportation infrastructure. Another area of public, private, and donor investment is in R&D infrastructure (i.e., mechanisms for collaboration among government, private sector, and higher education) to develop, disseminate, and scale research, information, and technologies.[5]
- Inclusivity can be achieved by supporting small market actors, including youth and women, through transformative social and trade policies, which produce a high return on poverty reduction investments. Support can also take the form of asset accumulation (training, extension, targeted savings mechanisms, access to finance and credit, and social capital) and stronger connections to market actors such as business development services, vendors, and customers.

Resilience

The second objective of the GFSS is increased resilience, or the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses, which is critical in reducing poverty.

- Effective resilience programming takes a holistic, multisectoral approach, building absorptive capacity (minimization of exposure or sensitivity to shocks and stresses/effective management and quick recovery when exposed), adaptive capacity (proactive and informed decision-making based on changing environmental, climatic, social, political, and economic conditions) and transformational capacity (social and governmental system-level changes) at the individual, household, community, national, and systems levels.
- Most resilience activities targeting individual-level change focus on asset accumulation, income diversification, and social protection. However, current approaches to measuring the impact of these activities do not align with five lenses of youth development (physiological, psychosocial, socioecological and sociocultural, economic, and policy and systems).
- Poverty in many USAID partner countries creates its own reinforcing cycle. Living in poverty may introduce stressors (and physiological reactions) that inhibit cognitive and physical development, potentially inhibiting the development of knowledge and skills—two key individual-level asset pools. In addition, other individual circumstances that are frequently associated with poverty – malnutrition, undernutrition, above-average disability prevalence, conflict, violence, living without parental care, migration, and other life-changing events – may further delay psychosocial development. The current evidence base for USAID partner countries on the impact of different models and interventions, as well as synergies and complementarities among interventions, is limited and mixed. It focuses predominantly on the physical impacts of impoverishment, however, and the evidence base on the psychological or psychosocial impacts (and their longer-term trajectories) is limited. Therefore, it is unclear if more comprehensive models that took those factors into account might yield more consistent evidence.

[4] Other innovations do not require investments in infrastructure and R&D such as much of bio-fortification and social policies around gender roles, as well as more traditional trade policy and indigenous and local community knowledge.

[5] To this end, USAID has funded a range of innovation labs focused on crops, productivity, food handling and safety, and policy and research. See https://www.feedthefuture.gov/feed-the-future-innovation-labs/ for more information.

- The individual attributes that serve as protective factors—that is, the characteristics that promote resilience—are contextually unique and socioculturally bounded. Therefore, interventions to build resilience at the individual and household levels must be tailored for the specific context and population.
- Social protection (nationally defined sets of social security guarantees including social insurance, social assistance, and health care) alone is not sufficient to sustainably build resilience or break the cycle of poverty. Both individual- and household-level programs can be highly effective in reducing long-term vulnerability to endemic and episodic shocks and stressors when designed for a specific context. Overall, economic inclusion programs show promising and potentially sustained impact on a range of well-being outcomes, with bundled interventions showing a greater impact on incomes, assets, and savings (i.e., reducing incidence of poverty or inequality) than standalone interventions. The impacts of economic inclusion programs also include reduced levels of deprivation, community spillover effects, and positive socioeconomic improvements in consumption, health, education, and social participation.
- A supportive socioecological context may be equally or more important to an individual's resilience than individual attributes, which is useful in thinking about approaches to interventions. As it may not be feasible to conduct rapid research into specific protective factors in each circumstance, focusing on community and national systems for support and protection (community-level resilience) may be as effective as individual- or household-level interventions.
- The debate around economic diversification vs. economic specialization at the individual level remains unresolved, in part because of the limited availability of information on risk tolerance and decision-making processes within households. In particular, there is little information on the extent to which youth have a voice in household decision-making processes or how their needs are taken into account. In addition, the decision-making and risk-assessment skills of youth may not be fully developed until their mid-to-late-20s, limiting their ability to make informed decisions about risk tolerance until that time.
- Cash transfers have a short-term poverty-reducing effect. Sustained impacts on income, assets, and savings are possible only through social protection plus economic-inclusion programs (also known as cash-plus programs) or broader economic-inclusion programs that use a bundled set of interventions. While the latter type of activity aligns well with a PYD lens and should be effective in supporting youth to achieve GFSS goals, cash-plus programs must be carefully targeted and focus on the most impactful components. Otherwise, they can become very complex, making them difficult to sustain and scale up.

Nutrition

The third objective of the GFSS is nutrition, which supports the other pillars through healthful physical and cognitive development. The following are key lessons around youth, nutrition, and poverty reduction.

- Investments are needed to provide more and better data on what nutrition programming works for youth and why. The evidence gap regarding specific nutrition needs in young adolescents (ages 10-14), older adolescents (ages 15-19), and young adults (ages 20-24) inhibits the design and development of youth-targeted interventions to improve nutrition (and other) outcomes. More effective interventions may depend on conducting additional research to establish population norms (for example, for age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization) and effective approaches in specific sociocultural contexts. Youth engagement strategies should be more specific about the subgroups they are engaging and why.

- Adolescence is a time of high nutritional needs given the significant physical and cognitive development that occurs in this life stage and is also a window of opportunity for catch-up growth. Catch-up growth can support improvements in cognitive development at this critical juncture. Failing to address nutrition deficits in adolescence – particularly in the context of adolescent pregnancy – risks entrenching intergenerational malnutrition.
- The current evidence supports expanding nutrition education and micronutrient supplementation/food fortification focusing on iodine, iron, zinc, and vitamin A for adolescents. In addition, in communities and households where food insecurity is chronic, food aid may be appropriate. Nutrition education is particularly important as food preferences and habits are formed in adolescence.
- Investments in nutrition are durable and appear to be cost-effective with the rates of return exceeding 3:1 for young children; however, specific rates of return for adolescent nutrition interventions are not readily available.
- To achieve nutrition goals, it is necessary to reform food systems to deliver diverse, fresh, healthful foods at scale, including to remote areas and marginalized groups. Expanding rapid and cold-storage supply chains, in particular, can increase the availability of varied, healthful fresh food and lessen people's reliance on heavily processed packaged food items.
- Despite its importance to physiological and cognitive development, improved nutrition alone is not sufficient to reduce poverty. It is, however, an important factor in a holistic approach to poverty reduction, as discussed below.

Linkages and Synergies among GFSS Objectives

Taken holistically, the GFSS represents a more comprehensive approach to poverty reduction in rural areas where agriculture is a mainstay of economic activity. The key points around youth and an integrated GFSS approach follow:

- The evidence base on multi-pronged approaches to simultaneously improve food security, nutrition, and resilience is still very limited.
- Youth are not merely targets and recipients of nutrition interventions but play important roles throughout food systems and are key to their transformation. Youth are particularly well positioned to drive the adoption of new technologies and practices, and to influence peers' food choices and attention to social issues related to food systems in ways that improve access to healthy diets.
- Program design should more intentionally build in learning questions to better understand effective approaches to engaging young people in food systems activities to improve diets and nutrition.

Findings: Lenses on Youth Development

The literature review found numerous lessons learned on poverty reduction through agriculture-led growth, resilience, nutrition, and inequality and equity, indicating extensive progress on the evidence base. As noted above, youth (aged 15–29) constitute a large proportion of the population in many USAID partner countries (up to 28 percent), but they are also three times more likely to be unemployed than older adults (ILO 2021). They therefore present a significant challenge and opportunity for increased employment, and particularly employment in agriculture, which accounts for more than 26 percent of employment globally and over 58 percent in low-income countries (ILO 2022).

Still, gaps in the evidence base remain, particularly around how best to help youth escape poverty and hunger and to understand their needs and the roles that they play in the food system. To begin

answering this question, it is helpful to consider five lenses on youth development determined by USAID and the YASLA team to be particularly germane: (1) physiological development, (2) psychosocial development, (3) socioecological and sociocultural approaches, including PYD, (4) labor and behavioral economics, (5) and policy- and systems-based approaches. Key messages from each lens for poverty reduction and reduced hunger are highlighted below.

Physiological Development

The biophysical aspects of human development are critical, as adolescence is the period in which individuals develop from child to adult – the most significant period of growth in a person's life after the first thousand days. The literature highlights key lessons for the GFSS.

- Adolescence is a period of rapid growth, and the body needs significantly more calories and micronutrients to develop optimally than it does in childhood or later adulthood.
- There are no fixed, global standards for the "normal" physiological development of adolescents. Normal physiological growth varies by population, and, as such, genetic, environmental, and energy intake and expenditure factors must be used to determine normal ranges. A dearth of information on longitudinal, dietary, anthropometry, and micronutrient status data in many low-income countries inhibits analysis and reporting of adolescent physiological development and well-being.
- Contrary to earlier evidence, recent findings show that some catch-up growth in the pubertal growth spurt may be possible with proper nutrition.
- New evidence is emerging on the efficacy of youth-focused nutrition interventions, but the evidence base remains limited.

Psychosocial Development

Psychosocial development during adolescence is as significant as physiological growth, if not more so in preparing youth to engage as adults in their communities. Several key lessons emerge for the GFSS.

- Adolescence is a critical period of psychosocial development in which youth develop their identities and shift their reference group from family to peers.
- Instability on any number of fronts (from parental behavior to political stability) in this period can cause delays in development or mental health issues such as post-traumatic stress, depression, anxiety, as well as lead to externalizing behavior problems.
- While individual and group interventions can be effective in addressing mental health issues, providing them at scale can be challenging, especially in resource-constrained environments. An alternative is using trauma-informed approaches in public settings where youth engage with others in their communities.

Socioecological and Sociocultural Approaches

Beyond individual development, socioecological and sociocultural approaches elucidate the importance of social interactions in shaping individuals, communities, and systems. This evidence base also has several key lessons to contribute to the GFSS.

- Youth are shaped by social processes in which they interact with their environments (at multiple levels) to gradually internalize knowledge, skills, and norms. The ideal support system is one in which the household, community, political-economic, and geographical/ecological/environmental levels reinforce each other in support of an individual's aspirations and goals.
- Achieving change requires cohort change, that is change between the individual level and the societal level, and change is easier when introduced at natural or expected transitions in life.
- Understanding youth aspirations and expectations is a critical component of developing effective interventions that align with their motivations. In addition, it is necessary to understand the

capacity for change—specifically, the pace at and extent to which change is possible in a given context.

Labor and Behavioral Economics

As youth engage in public activities and enter the labor market, the field of economics contributes a specific lens on behaviors and motivations that are relevant to the GFSS.

- Adolescents typically engage in egalitarian and efficiency-oriented behavior, with young women being oriented toward egalitarianism and young men toward efficiency. They may be fervent advocates for social change in their communities, as well.
- Youth remain a significant proportion of the agricultural workforce in many low- and middle-income countries.
- Increased agricultural productivity (driven by the intensification of the agri-food production system) is required for the structural transformation of rural economies (i.e., the process of long-term changes in a system of production and distribution of goods, services, and employment). Rural unemployment, on the other hand, drains productivity and negatively impacts rural structural transformation.
- Increases in agricultural productivity reduce the demand for labor, particularly in subsistence and household production, and strengthen earnings while shifting surplus labor to activities with higher productivity. At the same time, increased production can lead to lower prices and greater consumption. Governments and donors can support increased agricultural productivity through investments in human capital and innovation and technology that focuses on intensification of agri-food systems (as opposed to increasing the land under cultivation) particularly among rural smallholder producers; micro, small, and medium enterprises (MSMEs); and other small market actors.
- Adoption of innovation at scale, for example, irrigation, improved inputs (seed, fertilizer, mechanization), access to sanitary and phytosanitary certification, etc., also increases agricultural productivity and rural poverty reduction.

Policy- and Systems-Based Approaches

The final lens on youth development focuses on the enabling environment, which constitutes a critical element of the GFSS strategies for poverty reduction.

- Significant public investment has been directed toward labor supply strategies, such as programs to build the technical, socioemotional, and entrepreneurial skills of youth. There has been less focus on addressing the demand-side constraints that inhibit economic growth, including regulatory constraints on businesses and employment creation, particularly agribusiness, investment, market access, and youth engagement in policy.
- While public investment in agriculture systems, including infrastructure and R&D, can increase agricultural productivity and the incomes of low-skilled farmers, thereby hastening structural transformation, inefficient and low-quality investments that lack an inclusive approach can be regressive and further impoverish the rural poor and marginalize excluded groups.
- The source of public financing matters for the impact, durability, scale, and sustainability of poverty reduction. Tax incidence, relative price, and real exchange rate movements have distributional consequences on different workforce segments.

Conclusions

Effectively engaging youth in interventions designed to reduce poverty may require that governments, donors, and youth-serving organizations adjust their approaches. Current poverty reduction approaches measure the changes in factors contributing to or associated with poverty, but rarely clearly define and measure poverty reduction (i.e., incidence, depth, or severity). As poverty does not affect all youth in

the same ways, the socioecological model/PYD approach provides an overarching conceptual framework for ensuring that activities meet the needs and aspirations of diverse groups of youth effectively, particularly those who experience the most deprivations, trauma or conflict, or are otherwise vulnerable to shocks and stressors. The current utilization of the model, however, does not give sufficient emphasis to the importance of a prosocial orientation in youth activities; supportive interpersonal relationships with adults; physical well-being; and the role of culture and cultural norms (including gender norms).

Agriculture-led growth benefits the poor, and particularly the rural poor when concentrated in the agriculture sector. Human capital, one of the key drivers of agricultural productivity, represents one critical area of investment, and improvements should take into account physical and mental health (including absence of violence), cognitive development (including access to quality education), motivations and perceptions of self, and the enabling environment, particularly connections to others and activity in the public sphere, fully applying the PYD approach. Innovation is another key driver. Mobile and internet connectivity, digitization of food-system processes, affordable and accessible irrigation systems, electrification, road and transportation infrastructure, and R&D infrastructure are demonstrated to have the most significant poverty-reducing effects for households. And marginalized, small market actors, who often include youth (and young women in particular), benefit from targeted support and engagement, which can decrease inequality of access to resources and outcomes.

Resilience is a dynamic concept that operates at multiple levels (e.g., individual, family, peer, school, and community levels), and promotive and protective factors are often socioculturally and situationally dependent. As such, effective resilience programming must be tailored to both the shock or stress and the norms of the communities in which it operates (recognizing that economic inclusion may conflict with norms that exclude certain individuals or groups based on identity or other factors). Social protection measures provide short-term relief to poverty, but only multipronged economic inclusion activities result in longer-term poverty alleviation. The PYD approach aligns with multi-pronged economic inclusion activities to strengthen resilience at multiple levels (e.g., individual, family, peer, school, and community levels). For those youth who have been subjected to extreme shocks and stresses, however, additional mental health and other supports may be necessary. The identification of appropriate supports should consider factors related to challenges youth face (i.e., inequalities by age, disability, ethnicity, gender, gender expression, gender identity, native or Indigenous origin, race, religion, sex, sexual orientation, socioeconomic status, and other factors). Where resources are limited, trauma-informed approaches[6] may represent a best value way to engage vulnerable youth.

A central goal of the GFSS is to reduce malnutrition, which may contribute to poverty alleviation through multiple channels. Nutrition achieves durable outcomes in the form of improved cognition and physical health that can be applied to improve well-being. The literature on youth physiological and cognitive development points to a range of interventions that could be employed to complement and enhance the benefits of USAID's current focus on the first thousand days of life, including nutrition education for adolescents and communities broadly; micronutrient supplementation or food fortification of iodine, iron, zinc, and vitamin A; and targeted food aid where appropriate. Youth also have an important role in generating demand for food choices, whether healthful or unhealthful. This aspect of their involvement in the food system merits additional research, as it is currently poorly understood.

[6] Trauma-informed approaches recognize the impact of trauma on the lives and well-being of individuals. They promote safe environments for programming, participant choice, and participant empowerment (through choice and control over their situation).

Recommendations

USAID may wish to consider some adjustments to its strategies or activities in light of the emerging body of evidence on youth development. USAID may wish to consider the following in strategy and activity design:

- Defining poverty reduction (at least at the activity level) as reductions in the depth, severity, or incidence and determining appropriate measures for achievement of that goal, as well as measures for inequality as it relates to that goal.
- Refining USAID's application of the PYD model (using a development-systems theory perspective) in four critical ways:
    - Ensure that the prosocial orientation of youth (connection, character, and caring) is stronger in interventions around assets, agency, contribution, and enabling environment. Models might include service learning, disaster risk reduction activities, and engagement in community problem-solving.
    - Focus more on intergenerational approaches with supportive relationships with adults (one-to-one and within public spaces) as a critical aspect of the enabling environment. Models might include mentorship, apprenticeship, or association membership subsidies/support.
    - Incorporate nutrition and physical well-being beyond reproductive health as part of a broader strategy to promote and support young people's overall well-being.
    - Engage more intentionally with the role of culture and cultural norms in the enabling (or disabling) environment to create pathways for youth, and particularly marginalized youth to access more opportunities. Models might include intergenerational dialogues, sector-specific consultations and dialogues, and peer to peer mentoring and support.
- Understanding youth trajectories and the sociocultural, political, economic, and physical barriers that inhibit youth from fully participating in REFS-related programming (e.g., experiences of violence and exploitation for young men, young women, and youth who identify as non-binary; and early marriage; early pregnancy; and unpaid care work for young women) using in-depth youth analyses, gender analyses, political economy analyses, and multi-hazard risk analyses where appropriate. This understanding can then underpin activity designs targeted at specific life stages with appropriate supports.
- Gathering additional information in the activity design stage regarding the household allocation of resources, particularly for younger youth still living within a larger household, using in-depth youth analyses and community consultations focused on family decision-making, for example. This broader analysis will help ensure that choices around allocation and vulnerability to shocks are understood within a variety of household contexts.
- Intentionally targeting specific segments of the youth population who are poor and most vulnerable to poverty, shocks, and stressors, taking into account their various identities (age, disability, ethnicity, gender, gender expression, gender identity, native or Indigenous origin, race, religion, sex, sexual orientation, socioeconomic status, and other factors, etc.) rather than using a single cross-cutting intermediate result or overarching goals that address youth more generally. This may require more intensive use of youth analyses at key points in the program cycle.
- In contexts where GDP is low and the percentage of the workforce in the agriculture sector is high, focusing on the agriculture sector as the primary area of intervention and on human-capital improvements and innovation, in particular, with targeted support for marginalized, small market actors. In so doing, explore and combine push (supply-side) and pull (demand-side) approaches

to strengthening the ecosystem for the creation of more and better quality employment for youth at scale, including with a focus on gender inequality and youth heterogeneity.

USAID may also wish to consider how it could encourage partners to be more youth-sensitive, particularly through:

- Encouraging partners to apply trauma-informed approaches when working with the most impoverished youth and/or those who have experienced trauma.
- Tailoring resilience indicators at the individual, household, and community levels to specific sociocultural contexts to accurately identify critical resilience outcomes for youth (and other populations) and their predictors.
- Engaging youth in community- and systems-level resilience work, as well as nutrition education and other community-based approaches, to improving individual well-being.
- Supporting partner countries in gathering data on youth dietary, anthropometry, and micronutrient status, as well as data on factors associated with the age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization through existing community health channels. These data should be made publicly available through Ministries of Health or national statistical bureaus.
- Conducting additional research on the relationships between risk factors and poverty, looking at income, consumption, and patterns of intrahousehold allocation in order to better understand and predict the allocation of household resources to children and youth.

Introduction

Over many decades, governments, development agencies, nongovernmental organizations, and academics, among others, have asked a key question: How do people become less poor? The first United Nations (UN) Sustainable Development Goal (SDG) is to "end poverty in all its forms everywhere" by 2030. This goal and other SDGs were endorsed by Member States, including the U.S.

In 2017, the USG adopted the 2017–2021 Global Food Security Strategy (GFSS), which documented a whole-of-government approach to sustainably reducing global hunger, malnutrition, and poverty, with USAID among the USG agencies with significant responsibility for implementing the strategy. The updated GFSS 2022-2026 continues to outline three key objectives intended to address the drivers of poverty:

1. Inclusive and sustainable agricultural-led growth
2. Strengthened resilience among people and systems
3. A well-nourished population, especially women and children.

In addition to these broad objectives, the GFSS also entails cross-cutting emphases on systems, resource management, and inclusivity, particularly of women and youth. This last emphasis is critical, as poverty is often highest among female-headed households, and youth (ages 15–29) comprise a significant proportion of the population in many USAID partner countries (28 percent in least developed and low-income countries[7]) (UN Department of Economic and Social Affairs 2021) who face significant constraints making the transition to adulthood and both contributing to and benefitting from development gains. Gender divides widen in adolescence. While both young women and young men face major barriers to completing secondary education, the gender gap is wider for young women, increasing their risk of early marriage and pregnancy, and undermining their transitions to better livelihoods, health and well-being, also impacting that of their families and communities into the future.

While countries made significant progress in reducing poverty through 2015, some of those gains have been reversed in recent years. Poverty appears to be an almost intractable problem, with pockets persisting even in very wealthy societies. Poverty is also more prevalent in certain populations: In 2019, UN data showed that youth workers were twice as likely as adult workers to be living in extreme poverty (UN Department of Economic and Social Affairs 2021). These issues raise questions about whether the evidence for what works in reducing poverty works for everyone.

As USAID and other USG agencies undertake a consultative process to refresh the GFSS, it is useful to examine the latest evidence on how the GFSS objectives contribute to poverty reduction and to explore how GFSS objectives align with, complement, or operate at variance with the processes by which youth become healthy, engaged, productive adults in their societies, or to answer the questions: How do youth become less poor, and how can youth contribute to poverty reduction?

To explore these issues, the Youth in Agri-food Systems Learning Activity (YASLA) conducted a literature review. As a first step, YASLA briefly reviewed the evidence on poverty reduction. Next, the team explored how that evidence intersects with various schools of thought on youth development. Five lenses of youth development are particularly germane to poverty reduction: (1) physiological development, (2) psychosocial development, (3) socioecological and sociocultural approaches, including PYD, (4) labor and behavioral economics, and (5) policy- and systems-based approaches. In the sections that follow, we present the literature review methodology, the evidence base for the GFSS theories of change, lessons learned from youth development literature, and our conclusions and recommendations.

[7] Authors' calculations.

Methodology

In undertaking this review, the team conducted a literature search using Johns Hopkins University library databases, as well as publicly available databases, including the 3IE Development Evidence Portal, Academic Search Premier, Africa-Wide Information, AgEcon Search, Agriculture & Environmental Science Database, EBSCO (AGRICOLA and CAB Abstracts), Econlit, Google Scholar, and JSTOR.

The team used the following search terms: adolescent nutrition, adolescent physiological development, adolescent psychosocial development, intrahousehold inequality, sociocultural development and youth, socioecological development and youth, youth agricultural training, youth agriculture interventions, youth employability in agriculture, youth employment agriculture, youth livelihoods agriculture, youth livelihoods resilience, youth livelihoods water, youth poverty reduction, youth resilience interventions, youth resilience poverty, and youth water interventions. These searches yielded more than 20,000 results. The team then filtered the results for publication dates of 2015 or later and for those that presented data from USAID partner countries or similar settings. This process reduced the number of documents to about 850, which was still more than could be reviewed given time and resource constraints. The team further filtered the documents to focus on meta-analyses, large-scale studies, and the most topically relevant documents, reducing the number of documents to roughly 200.

As with any literature review, and as noted above, time and resource constraints forced the team to be intentional about which bodies of literature and sources to include and exclude. As such, this review is comprehensive but not exhaustive.

Evidence Base for Global Food Security Strategy Theories of Change

The GFSS was and is based on a considerable amount of research on what types of interventions yielded the greatest impacts for individuals, communities, and countries in terms of rural poverty reduction, resilience and disaster risk reduction, nutrition, and water, sanitation, and hygiene. The evidence base at the time the GFSS was developed, however, still had several significant gaps:

- Which market systems development interventions have the largest positive impact on the poor, women and youth?
- What is the emerging evidence on the relationship between policy systems (defined as policy agendas, institutions, relationships, and processes) and food security?
- What individual-, household-, community-, and systems-level resilience capacities are important for enabling poverty escapes in different contexts, and what risks pose the greatest threats to sustaining these escapes over time?
- What are the key youth-specific opportunities and constraints to engaging in agri-food systems?

To answer these questions, the GFSS had a strong learning agenda, and development actors and academics across the world pursued their own research on effective poverty and hunger-reduction efforts. This next section of the literature review focuses on what has been learned during GFSS implementation, both generally and specifically as it relates to youth participating in agriculture-led economic growth, resilience, and nutrition-specific activities. The discussion is organized by GFSS objective.

Cross-cutting and Priority Objectives: Inclusion of Women and Youth, Countering Inequality and Inequity

Poverty is a complex phenomenon, and USAID recognizes that in any society, some people have more constraints on their economic choices than others. As a critical approach to reducing poverty, therefore, the GFSS includes cross-cutting intermediate results (CCIRs 3 and 4 in the 2016-2021 GFSS,

renumbered CCIR 2 and 3 in the GFSS updated in 2021) intended to address the inclusion of women and youth, respectively. The rationale for this focus on women and, to a lesser extent, youth was based partially on the patterns of disparities in income in male- and female-headed households in high-income countries (see, for example, Christensen 2019 for a thorough summary). Thus was the theory on the feminization of poverty expounded and viewed to be a global phenomenon. Beyond the traditional sources of information, such as income and consumption, evidence regarding decision-making in many developing countries signaled that women and youth have traditionally had more circumscribed opportunities and considerably less control over household and community resources than men, bolstering the view of poverty as feminized. Some scholars, however, have problematized what others dubbed the feminization of poverty, citing that it treats the female population, and particularly female-headed households, as homogeneous, masking significant differences within and across countries (see Chant 2007 for a thorough summary).

For at least three decades, national governments and donor agencies have invested significant resources in including women more holistically in their programing; they have also targeted health, education, and micro-credit interventions to girls and women and increased social protection programming. The extent to which those interventions have yielded the intended results is not yet clear. **Several recent studies found that independent of any intervention, most female-headed households were as well off or better off than male-headed households when examining short-term (12 months) income and consumption data**. Indeed, a recent World Bank Policy Research Paper concluded that female-headed households experienced faster poverty reduction (defined as increases in income and consumption) than those headed by males and contributed almost as much to poverty reduction as male-headed households, despite representing a much smaller pool of households overall (Milazzo and van de Walle 2015). Earlier studies found similar patterns in Vietnam and Thailand (FAO 2002; Klasen, Lechtenfeld, and Povel 2011). These studies were instrumental in showing the key characteristics of female-headed households that were better off and illustrating how household organization varied within the female-headed household category. For example, female-headed households included households headed by single women (unmarried or divorced) and widows with their children (which tended to be the poorest among the female-headed households) as well as households from which men had migrated for work; households in which both husband and wife resided, with the wife being reported as the head of household; multigenerational households with multiple contributing adults; and extended family households with multiple contributing adults. Therefore, a key question emerged about the conditions under which female-headed households were worse off than male-headed households.

A more recent study by Brown and van de Walle (2019) determined that independent of any intervention, female-headed households experienced lower poverty rates than male-headed households in West Africa, but not in Central, East, or Southern Africa. **Key factors that differentiated less poor female-headed households included the increased access of married women to institutions and resources within their communities and improved economies of scale at certain thresholds**.

Another key factor in predicting poverty beyond income and consumption is vulnerability to shocks. Less scholarly research has been conducted in this area. Klasen, Lechtenfeld, and Povel (2011) identified a range of key factors contributing to vulnerability to shocks, including access to land, labor, credit, and insurance markets; discrimination based on cultural norms; higher dependency burdens than men; greater economic immobility than men; and unpaid familial caregiving responsibilities. While some of these factors have been well-documented, **there is little evidence on how factors associated with vulnerability to shocks affect poverty, as measured by income and consumption, particularly over a long period of time**. Klasen, Lechtenfeld, and Povel (2011) conducted a further analysis of poverty in rural Vietnam and Thailand using those vulnerability factors. They found female-headed households were not significantly more vulnerable than male-headed households, except for households headed by widows and unmarried women.

Youth poverty measures are perhaps less precise than household measures because they are generally extrapolated from household statistics. Thus, if a household falls below the threshold for poverty, all members are assumed to be poor. Conversely, if a household is not below the poverty threshold, its members are counted as not poor. But a growing body of literature rejects the idea of assigning poverty at the household level, in large part because unequal control over resources or unequal allocation of resources among household members can effectively result in some members of non-poor households being poor (Klasen 2006; Falkingham and Balschieri 2009). **Current models of intrahousehold allocation do not yet robustly explain or predict the allocation of resources to children and youth** (Chiappori and Meghir 2015), which suggests more work is needed in this area.

Like poverty, inequality is difficult to measure. A recent surge of scholarly work on measuring inequality has introduced a range of statistical methods to measure multidimensional inequality, particularly the intersectionality of the individual attributes that contribute to poverty (Aaberge and Brandolini 2015). **These advances in measuring inequality, however, rely on specific value choices in selecting analytical approaches and methods** (e.g., whether the depth of poverty [i.e., the extent of deprivation] is more critical than the incidence of poverty). To effectively examine available datasets to determine the best interventions, the goal of those interventions must be clear. For example, is the goal to reduce the number of people facing severe deprivation on a few fronts, reduce the number of people experiencing deprivation on multiple fronts (to any degree), or minimize the number of people deprived on one particular measure? An intervention that aims to reduce the incidence of poverty will likely target those closest to the poverty line who experience the least deprivation; on the other hand, an intervention that aims to reduce the severity of deprivation among the poorest will likely target the most deprived segments of the population but may not succeed in changing the proportion of poor households (poverty rate). Governments and donors must choose the analytical approaches and measurement tools that align with their intervention goals, which may make cross-country comparisons difficult.

Key Lessons for Poverty Reduction

Several poverty reduction approaches appear to be effective in improving the well-being of individuals and households. Moving forward, **it is important to determine poverty reduction goals—lessening the depth or severity of poverty or reducing the overall incidence of poverty—then to choose the approach to measuring poverty reduction**. In recent years, USAID has tended to use the $1.90/day (now $2.15/day) international poverty line measure of poverty, which is relevant and may indicate reductions in the overall incidence of poverty, but it does not indicate that all GFSS goals have been met. Specifically, the goal of reducing malnutrition may not be feasible even if households' incomes surpass the international poverty line, particularly for households where intense physical labor results in higher dietary energy needs. Further, households may balance individual needs on a limited budget (i.e., eggs to ensure children or youth have sufficient protein versus substantially more maize to ensure adults can labor for a full day) in ways that are detrimental to the children and youth (Colorado State University College of Agricultural Sciences, 2022).

Further, given that women, and even female-headed households, do not seem to be homogeneously more vulnerable than men and male-headed households, **intentionally segmenting and targeting women who are poor and more vulnerable to poverty, is recommended rather than using a single cross-cutting intermediate result or overarching goals that address women more generally**. This step will require conducting thorough gender analyses that take into account vulnerability to shocks similar to those used by Klasen, Lechtenfeld, and Povel.

In addition, because youth poverty data are often embedded in household data, increased clarity on the poverty reduction goals will partially improve the ability of USG agencies and their partners to measure impact. But **additional information on household allocation of resources may be necessary to capture reliable data, particularly for younger youth still living within a larger household**. In

the short term, this will require that in-depth youth analyses to ensure that choices around allocation and vulnerability to shocks are understood within a variety of household contexts.

Summary of Key Points

- Defining poverty and determining how to measure poverty reduction are important prerequisites for addressing inequality among youth and other populations.
- Achieving a reduction in the incidence of poverty, defined as those living below $2.15/day, does not necessarily eliminate malnutrition and hunger, and children and youth may suffer in particular as households make choices about how to meet the needs of all members.
- Some of the root causes of inequality among youth outcomes include severe stressors and trauma, sociocultural norms, and an unsupportive enabling environment for youth development based on one or more individual attributes (e.g., biased gender norms). These causes will vary, and, as such, youth cannot be treated as a homogenous group. While all youth may in some ways be at a disadvantage compared to adults, understanding the specific vulnerability factors youth face in different contexts is an important part of engaging youth effectively and reducing poverty among young people.

Objective 1: Inclusive and Sustainable Agriculture-Led Economic Growth

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Central to our theory of change is that a productive, efficient agriculture and food system can drive improved living standards and resilience. Sustainable, inclusive agriculture-led economic growth does this through expanded participation in markets, greater access to and affordability of safe and nutritious food, improved resilience, and broader availability of jobs. Inclusive growth refers to economic growth that engages and benefits all segments of the population and significantly reduces poverty. Inclusive growth works best when it focuses on increasing access to economic opportunities for marginalized and underrepresented groups while ensuring that markets are competitive.

Agriculture transformation is realized by increased total factor productivity—which is more efficient use of land, labor, capital, and other inputs—and a shift of livelihoods from lower-productivity to higher-productivity sectors, while supporting broader economic sectoral change. Moreover, agricultural transformation relies on many drivers, which include: a supportive and inclusive enabling environment; increased integration with the global economy through trade; private sector engagement with U.S., regional, and domestic firms; sustainable inputs, especially clean water and healthy soil; improved human and institutional capital; and investments in infrastructure.

Inclusive agriculture-led growth reinforces sustainability as producers and enterprises adopt innovative approaches that allow them to thrive and adapt to changing climate, market, political, social, and health conditions while protecting natural resources. Communities benefit from increased incomes, employment, and economic opportunities in the agriculture and food system and beyond, and the increased availability and affordability of safe and nutritious foods in local markets. (GFSS, 2022-2026 p. 27).

A longstanding assumption underpinning development policies and interventions is that increased agricultural productivity contributes significantly to improved livelihoods among the rural poor, mainly smallholder farmers and small enterprises, including youth and women. Evidence supports this linkage: strong correlations are evident among increased economic growth, agricultural productivity, and

poverty alleviation as producers' incomes increase and food becomes more abundant, diverse, and affordable for consumers (Jayne, Yeboah, and Henry 2018).

Key Lessons for Poverty Reduction

An increasing agricultural productivity rate and population growth (or decline) drive the economic structural transformation of the agri-food system (discussed in more detail in the Labor Economics section below), which "frees up" and shifts labor out of agriculture into more productive non-farming sectors. This transformation has the potential to increase employment opportunities and incomes, reduce food insecurity, and decrease poverty *if* it is driven principally by productivity gains resulting from the intensification of agri-food systems rather than increases in the total amount of land under agricultural production. Furthermore, this transformation occurs through complementary and reinforcing pathways. Population growth, increasing incomes, and changing diets drive demand for foods and diversification away from traditional foods. Increased food availability and diversification are driven by increases in agricultural productivity, incomes from production, and employment. As a result of this structural transformation, the agri-food system is increasingly complex, with stronger linkages and intersectionalities between the agriculture and non-agriculture sectors, as well as rural-urban locations (Dorosh and Thurlow 2018).

Often, labor productivity among youth and women (particularly young women) is lower than for men overall and older adults. Several factors contribute to this gap: the rate of youth not in education, employment, or training; the unpaid participation of youth and women in household enterprises and farms; and the participation of youth and women in the unpaid household and care work that facilitates fuller participation of other household members in paid work (Heckert, et al. 2019). Thus, effectively engaging women and youth offers a significant opportunity to improve labor productivity.

Support to small market actors, including youth and women, has a high return on poverty reduction investments. A substantial body of evidence indicates that interventions to increase the productivity of rural smallholder producers; micro, small, and medium enterprises (MSMEs); and other small market actors, including by removing barriers, may be the most effective lever for reducing rural and urban poverty. Many small market actors, especially those owned by youth and women, face structural barriers that limit their ability to take up the economic opportunities created by structural transformation.

The evidence on which constraints to prioritize and what practices best reduce poverty is mixed. Critical barriers and programmatic implications are summarized below:

- *Human capital.* Human capital is defined as knowledge, skills, and health that can be transformed into other tangible assets. The impact of education on poverty reduction is mixed. Despite increases in educational attainment among rural youth in many countries, compared to urban cohorts, rural residents continue to have fewer years of formal schooling, as well as lower-quality schooling. **Rural access to quality education and skills-building resources and opportunities is limited, especially for youth and women, resulting in gaps in technical, cognitive, and socioemotional skills.** As a result, they lack the cognitive, socioemotional, and technical skills necessary to increase productivity, as highlighted by recent studies that decomposed productivity factors and found that cognitive skills explain earnings and that socioemotional skills drive labor supply (Acosta and Muller 2018). Though education is important for rural non-farm employment and improved on-farm productivity, on its own, it is not enough to help ensure poverty reduction. A common finding across studies is that people working in non-farm jobs tend to have more years of schooling. This difference is often thought to be one reason why youth are more likely to work off the farm. Yet a series of case studies identifies factors other than education that are as or more important to their participation in and profitable livelihoods from off-farm work. These include better access to markets,

transportation systems, and electricity in Ghana (Diao, Fang, et al. 2019); capital accumulation, work experience, and social and economic networks in Malawi (Benson, Erman and Baulch 2019); and work experience and social networks in Ethiopia (Schmidt and Bekele Woldeyes 2019). Education is undoubtedly an asset for youth, but it does not guarantee that they will lead or benefit from the rise in the rural non-farm economy. **Investing in education, therefore, is necessary but insufficient. Investments in infrastructure and market development are also critical to help ensure that youth (and adults) can participate in agricultural transformation processes** (Mueller and Thurlow 2019).

- **Human capital improvements rely on healthy physical and physiological development (based on good nutrition, healthful choices for physical activities, and the absence of extreme stressors or trauma) and psychosocial and cognitive development processes, including the formation of reciprocal one-to-one and caring adult relationships and participation in the community through work and civic means (heavily influenced by sociocultural factors and the accessibility of such pathways).**
- *Innovation and technology.* Access to and uptake of appropriate technology and innovation are essential in increasing productivity. The impact, however, may be temporary and varied, depending on market actor characteristics and market efficiency. Appropriate and climate-smart technology related to irrigation, improved inputs (fertilizers, improved seed varieties, integrated pest control, increased access to land, finance, etc.), mechanization, infrastructure, products, and services are all fundamental to driving productivity through agricultural intensification and improved land use. However, **evidence has shown that the introduction of new technologies, specifically seed varieties and climate-smart approaches, can negatively impact smallholder farmer income due to inadequate roll-out or the absence of complementary support that increases the access of smallholder farmers, MSMEs, and/or marginalized populations, such as youth and women** (Langyintuo 2020). Unlike larger market actors, these populations often lack the assets, knowledge, and means to access and benefit from technological advances, widening the productivity gap between large and small market actors. In addition, the introduction of technologies that exclude these populations can strengthen the competitive advantage of larger, resource-rich large market actors (Singh, et al. 2020).

Economic Inclusion and Equality

Economic inclusion and equality help translate economic growth to poverty reduction. The income inequality elasticity of poverty is stronger and more significant than income growth elasticity, with results suggesting that reductions in income inequality are more important for poverty reduction than increases in income growth (Andrews, et al. 2021; Mahoozi 2016).

A growing body of evidence supports the role of agriculture-led economic growth in achieving equality and inclusion at the household level. Measurement of expenditure growth and distribution of these expenditures across households shows that "…income growth from agriculture has a progressive effect on the distribution of expenditures, drawing the conclusion that income growth from agriculture is disproportionately beneficial for the poorest households in the poorer countries" (Ligon and Sadoulet 2018, 427). A discussion of intra-household allocation follows under Objective 4: Inclusion of Women and Youth, Countering Inequality and Inequity.

Key Assumptions about Durability, Scale, and Sustainability

The role and impact of agriculture-led economic development on poverty reduction remains a heated debate. Research in recent years has focused on better understanding the key assumptions around and contextual drivers of poverty reduction through agricultural growth.

Agriculture's contribution to poverty reduction depends on the country and sectoral context. Taking into account the sector's productivity, indirect impact on growth in other sectors, inclusion of low-paid, unskilled workers, and size in the overall economy, evidence suggests that growth in the agriculture sector is two to three times more effective at reducing poverty than the same amount of growth in other sectors. Cross-country econometric evidence shows that growth in the agriculture sector has the greatest poverty reduction impact—3.2 times greater than non-agriculture sectors—on the lowest-income earners ($1/day headcount poverty measure). On the other hand, less poor populations ($2/day headcount poverty measure) benefit more from non-agriculture growth (Dorosh and Thurlow 2018; Christiaensen, Demery, and Kuhl 2011).

Though the poverty reduction impact of agriculture-led growth is greatest in the poorest countries and those with the largest share of GDP held by agriculture, the impact is likely to weaken as development progresses. Furthermore, the advantage of investment in agriculture diminishes as a country produces wealth. Research on literacy levels and the impact of agriculture growth indicates that when literacy rates are low, agricultural growth produces a stronger poverty-reducing effect than non-agricultural growth. But this poverty-reducing effect did not extend to reducing the level of income inequality (Ligon and Sadoulet 2018).

The intersectionality of non-agriculture subsectors and agriculture is important to poverty reduction, and evidence increasingly highlights the fallacy of the agriculture versus non-agriculture debate because agricultural productivity is closely linked to growth in non-agricultural sectors. Jayne, Yeboah, and Henry (2018) argue that agriculture is the major driver of development for the non-farming economy. As agricultural productivity rises, driving increases in profitability of on-and off-farm activity that raise incomes, the consumption of non-agriculture goods and services climb accordingly. Therefore, agriculture and population growth are potentially major drivers of other sectors for two reasons: (1) markets evolve to support the availability of agro-produce as raw materials for agro-processing, and (2) increased accessibility and affordability of food for the growing population. Thus, the agricultural and non-agricultural sectors are interdependent in development, as seen, for example, in sub-Saharan Africa (SSA).

The trade, transport, and agro-processing subsectors have a progressive impact on rural development and poverty reduction on par with that of agriculture production. Evidence suggests that backward and forward linkages between agriculture and subsectors of trade and retail multiply the impact. For example, increased productivity in transport and trade reduces the costs and increases margins on all goods and services, including agriculture. Similarly, transport and trade have a direct poverty reduction impact because they are dominated by low-skilled, low-wage workers (Dorosh and Thurlow 2018).

Growth in some non-agriculture sectors, principally extractive subsectors, can result in decreasing agricultural productivity levels due to competition for labor and resources, the result of resource windfalls, and a lack of spillovers from the manufacturing sector (Dorinet, Jouvet, and Wolfersberger 2021).

Summary of Key Points

- Increases in agricultural productivity contribute significantly to improved livelihoods among the rural poor, mainly smallholder farmers and small enterprises, including youth and women.
- Strengthening labor productivity among youth and women (particularly young women) through improvements in education, training, and employment offers a significant opportunity to improve productivity in agriculture and other sectors as well.
- Growth in the agriculture sector can be two to three times more effective in reducing poverty than the same amount of growth in other sectors. However, the impact of growth in agriculture

weakens as GDP increases and as the workforce shifts from agriculture to more productive sectors.

- The interdependency of economic sectors means that growth in agriculture is dependent on the health of trade, transport, retail, and other sectors. Growth in the agriculture sector likewise supports growth in other sectors.
- The key factors supporting productivity improvements in agriculture (and, indirectly, poverty reduction) are human capital (defined as knowledge, skills, and health that can be transformed into other tangible assets) and innovations.
- Human capital improvements rely on healthy physical and physiological development (based on good nutrition, healthful choices for physical activities, and the absence of extreme stressors or trauma) and psychosocial and cognitive development processes, including the formation of reciprocal one-to-one and caring adult relationships and participation in the community through work and civic means (heavily influenced by sociocultural factors and the accessibility of such pathways). A rural-urban gap in educational quality and attainment continues, however, with rural youth having fewer opportunities to develop the cognitive, socioemotional, and technical skills necessary to increase productivity.
- In rural areas, factors other than education may be equally important to improve productivity and reduce poverty (particularly in off-farm work), including work experience, social networks, capital accumulation, and better access to markets, transportation systems, and electricity.
- Innovations in the form of technologies that improve overall productivity through higher yields or reduced costs require investments in infrastructure as well as research and development (R&D) systems. The literature identifies the following key areas for investment or subsidization: mobile phone and internet connectivity, digitization of food-system processes, affordable and accessible irrigation systems, electrification, and if targeted correctly, road and transportation infrastructure. Another area of public, private, and donor investment is in R&D infrastructure to develop, disseminate, and scale research, information, and technologies.[8]
- Inclusivity can be achieved by supporting small market actors, including youth and women; such support also produces a high return on poverty reduction investments. Support can take the form of supporting asset accumulation (training, extension, access to finance and credit, and social capital) and stronger connections to market actors.

Objective 2: Strengthened Resilience among People and Systems

> *Resilience is the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.* (Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance, p. 5).

[8] To this end, USAID has funded a range of Innovation Labs focused on crops, productivity, food handling and safety, and policy and research. See https://www.feedthefuture.gov/feed-the-future-innovation-labs/ for more information.

Poor and marginalized households are more negatively impacted by external shocks and stressors than the general population. Economically marginalized populations have limited absorptive[9] and adaptive[10] capacities to prepare for and mitigate potential risks, as well as to adapt to a shifting and intensifying risk landscape—especially concerning climate change—and recover from shocks and stressors. Furthermore, many institutions in developing countries lack the requisite transformational capacity[11] at multiple levels to develop policies and deliver services that support resilience.

Effective resilience programming takes a holistic, multisectoral approach, building absorptive, adaptive, and transformational capacities at the individual, household, community, national, and systems levels. For example, some USAID programming incorporates agriculture-led growth, improved nutritional outcomes, and inclusive policy systems to mitigate vulnerabilities and build assets at the household and community levels. Such approaches also account for differences in both risks and resilience capacities that exist between and within households, including differences between men and women and male- and female-headed households. Similarly, the risks to, and capacities needed by youth populations must be considered at each level (individual, household, community, national, and systems) (Pfefferbaum, Van Horn and Pfefferbaum 2017).

Key Lessons for Poverty Reduction

Increasing the resilience of individuals, households, and nations to shocks demands a multisectoral, layered, cost-effective systems approach (Vaughan 2018). Unfortunately, much of the evidence is context-specific, and research on long-term, effective approaches to building resilience has been limited. Community-level resilience approaches, for example, are extremely dependent on context, individual actors, and heterogeneity, as well as risks such as weather, climate change, and politics. At the community and national levels, evidence is also context-specific, and large gaps remain in our understanding of cost-effectiveness and long-term implications. In addition, although large bodies of research and evidence on youth resilience at the individual level in high-income countries exist, the evidence for youth in low- and middle-income country contexts is limited.

At the **individual level**, PYD approaches engage youth in solving critical development challenges in ways that build agency and strengthen developmental abilities (i.e., intellectual, physical, social, and emotional competence). USAID's PYD approach focuses on four key domains: assets, agency, contribution, and enabling environment. Most activities predominantly target youth assets, however, and only around one-third address all domains (Alvarado, et al. 2017). Moreover, the evidence for PYD efficacy in lower- and middle-income countries is limited, and in many cases, of poor quality (Alvarado, et al. 2017). Some key lessons have emerged, however, including that (1) a systematic approach, working with numerous stakeholders across multiple settings, is needed; (2) transferable skills and knowledge are more critical than technical, vocational, or academic skills; and (3) successful activities include innovative, youth-led activities (Alvarado, et al. 2017).

At the **household level**, the graduation model is seen as effective for supporting households to proactively mitigate, prepare for, and recover from external shocks and stressors. The graduation model targets individuals and households with strategically sequenced and layered interventions that build resilience capacities, often combining cash or asset transfers with livelihood support, including training and voluntary savings, among other interventions. But these approaches have been critiqued as

[9] Absorptive capacity: The ability to minimize exposure or sensitivity to shocks and stresses (ex-ante) where possible and to manage and recover quickly when exposed (ex-post).

[10] Adaptive capacity: The ability to make proactive and informed choices based on changing environmental, climatic, social, political, and economic conditions.

[11] Transformational capacity: System-level changes, such as investments or improvements in governance mechanisms, agroecological systems, infrastructure, formal and informal social protection mechanisms, basic service delivery, and policies/regulations.

unsustainable and costly, at least for governments and individual donors (Paul, Dutta and Chaudhary 2021). A newer model of economic inclusion, social protection cash-plus programs, is currently thought to be more effective and to better leverage limited public resources when combined with agriculture and rural development investments that support increased livelihoods, improved food access, and increased productivity (Food and Agriculture Organization of the United Nations 2015). Social protection cash-plus programs frequently bundle cash transfers, livelihoods support, education or training, and health and nutrition support for households. They are currently cost-prohibitive at scale, however, and further research is focused on increasing efficiencies and cost-effectiveness (Paul, Dutta and Chaudhary 2021).

At the **systems level**, interventions focus on three domains: (1) resilient and inclusive markets that support price stability and reduce prices through competition; (2) environmental resilience to external shocks from weather, natural disaster, and conflict through disaster preparedness and early-warning systems; and (3) sociopolitical stability. Resilience interventions at the community, national, and international levels generally take a systems lens to build the economic, social, and environmental ability of market systems to equitably allocate resources, draw on system-level resources (such as social safety nets, social capital, the financial system, or government assistance), and innovate to solve problems in the face of shocks and stresses (Sabates and Devereux 2015; Roelen and Devereux 2019). Although the evidence from low- and middle-income countries is limited, recent scholarship in high-income countries focused on the benefits of engaging youth in systems-level resilience activities in their communities has found that youth benefit from the improved systems; their involvement is also helpful for their psychosocial development (Pfefferbaum, Van Horn and Pfefferbaum 2017).

Social protection measures, specifically cash transfers, are shown to support resiliency and poverty reduction at the household level by reducing liquidity constraints, smoothing and increasing consumption, and positively impacting saving and borrowing behavior. Transfers perform better at closing the poverty gap (reducing deprivation) than they do at reducing incidence of poverty or inequality (World Bank 2018). Although research is limited and largely context-specific, evidence suggests that a broad range of economic-inclusion programs show promising and potentially sustained impact on a range of well-being outcomes, with bundled interventions showing a greater impact on incomes, assets, and savings than standalone interventions (Paul, Dutta and Chaudhary 2021). Similarly, an Overseas Development Institute (ODI) review of evidence between 2010 and 2015 indicates that in the short and medium terms, cash transfers increase expenditure on food, access to schooling, use of health services, dietary diversity, and nutrition indicators. Furthermore, the positive impacts of cash transfers include increased savings and productive investments. Positive impacts on investment in livestock and agricultural inputs and other agriculture assets are also consistently found across conditional cash transfers in Latin America and unconditional cash transfers in SSA. Cash transfers also can have a positive impact on businesses and employment participation, as well as reduced child work and child-work intensity. "This suggests that cash transfers not only play a role in reducing poverty by redistributing resources to the poor but also foster greater economic autonomy and self-sufficiency" (Bastagli, et al. 2016, 5).

The State of Food and Agriculture 2015 makes the case that social protection interventions alongside agricultural and rural development programs are effective. Social protection stimulates investment in agricultural production and other economic activities. "Social protection enhances nutrition, health and education, with implications for future productivity, employability, incomes and well-being" (Food and Agriculture Organization of the United Nations 2015, 84).

While disaggregated information on the effectiveness of specific combinations of interventions at the systems level is limited, some outcomes have been well documented. They include reduced levels of deprivation, community spillover effects, and positive socioeconomic improvements in consumption, health, education, and social participation. Additional research is needed on the complementarity of

interventions, including cash transfers, asset transfers, financial inclusion, coaching, peer mentoring, behavior change, training and other skills-building models, social capital and linkages, and climate-adaptation approaches (Sabates and Devereux 2015; Roelen and Devereux 2019).

Key Assumptions about Durability, Scale, and Sustainability

Evidence on the impact of different models and interventions, as well as synergies and complementarities among interventions, is limited and mixed. Evidence shows that packaging cash transfers with human capacity building and support services can result in a larger impact. Two economic-inclusion programs in Uganda, Women's Income Generating Support (WINGS) and the Youth Opportunities Program (YOP), are illustrative of the potential outcomes. After WINGS provided five to eight days of training, four to five follow-up support visits, and a $150 (300,000 Ugandan shillings) cash grant per participant, monthly income increased by between 67 and 151 percent, depending on the variation of the treatment. While the percentage increases in monthly income were significant, the actual amounts were less than $0.01 per month (5.1 to 7.9 Ugandan shillings) (Blattman, et al. 2016). Another study found that YOP's small grants ($400) increased earnings by 38 percent initially, but impacts dissipated over time (Blattman, Fiala and Martinez 2020).

Many cash transfer programs target women, aiming to empower them in household decision-making processes. The actual outcomes are inconclusive with regard to gains in women's influence in household decision-making, except in female-headed households. Evidence does, however, indicate that positive synergies occur when cash transfers are tied to agricultural support and policies, such as inputs subsidies, agricultural credit, and crop insurance, among others (Food and Agriculture Organization of the United Nations 2015).

Social protection (nationally defined sets of social security guarantees including social insurance, social assistance, and health care) **alone is not sufficient to sustainably build resilience or break the cycle of poverty.** Programs that go beyond social protection to include economic inclusion, also known as cash-plus programs, are more effective and better able to leverage limited public resources when combined with agriculture and rural-development investments that improve livelihoods, access to food, and productivity (Food and Agriculture Organization of the United Nations 2015).

Comprehensive social protection cash-plus programs, while effective, may be prohibitively expensive as well as difficult to sustain and effectively scale up. To address this issue, research is increasingly focused on understanding the key cost drivers of cash-plus programs and optimizing their costs. Evidence suggests that standalone programs implemented by a single partner are unlikely to achieve sustainable scale; however, government-led programs that coordinate and leverage investment from donors, the private sector, and civil society may hold more promise for a sustainable, scalable approach (Paul, Dutta and Chaudhary 2021). Early evidence from a scaled down cash-plus program in Niger showed significant improvements for consumption, food security, and psychosocial impacts (including community-level social cohesion and within-household relations) (Bossuroy et al. 2022). Ongoing research is underway to understand which components of cash-plus programs may be most critical and most easily sustained and scaled.

The question of economic diversification versus economic specialization remains unresolved. Diversifying livelihoods in the non-farm or off-farm sectors, which can increase incomes and reduce risks, has long been seen as important for building resilience. One body of evidence supports the value of households having multiple income streams. The same study showed that contextual variables impacted the poverty and risk-reduction power of income diversification, specifically the individual or household age, level of education, and time allotted to nonagricultural activities (Osabuohien, et al. 2019). Other evidence, however, emphasizes the importance of better understanding the benefits of specialization versus diversification. On the one hand, diversification can be optimal because different livelihood streams have different types and levels of risk to shocks and

stresses, thereby providing protection against future unpredictability. On the other hand, diversification may not always be the best approach for the rural poor; in some contexts and livelihoods, it could be disadvantageous to divide full-time employment among multiple income streams (Liao, Barratt, and Kassam, 2014; Goulden, Adger, Allison, and Conway, 2013; Rapsomanikis, 2015).

Climate-smart approaches are needed to sustainably increase productivity. Climate change impacts smallholder farmers and micro-enterprises more than larger market actors who have the resources to adapt more readily. For example, relying on rain-fed irrigation—as many small producers do—is increasingly risky. "Current land-use practices are eroding the capacity of the natural resource base to sustain productivity for current and future generations, with extractive land-use practices causing alarming rates of land degradation: loss of topsoil averages 29 tons per [hectare], per annum, and tree cover is declining at over 1 percent per annum" (Singh, et al. 2020, 12). In the context of climate change and variability, traditional approaches to increasing productivity through improved inputs are proving less effective. For example, some fertilizers and pesticides are no longer effective during periods of drought (Jayne, Yeboah and Henry 2018). Evidence suggests that climate-smart technology, such as water conservation techniques; land tenure; weather-index and agriculture insurance; and sustainable resource-management plans are essential (Burian, et al. 2019).

In the context of natural disasters, resilience is a cost-effective approach. A review of natural disasters in 117 countries attempted to model estimates of country-level socioeconomic resilience. "Because hazards disproportionately affect poor people, each dollar of global natural disaster-related asset loss is equivalent to a $1.6 reduction in the affected country's national income, on average" (Hallegatte, Bangalore and Vogt-Schilb 2016, 96). Evidence from the United Kingdom's then Department for International Development activities in Kenya and Ethiopia estimates that over 20 years, every dollar invested in resilience will result in $2.9 in reduced humanitarian spending, avoided losses, and development benefits. When modeled over a 10-year timeframe—as in the context of two high-magnitude droughts—every dollar spent on resilience generates two dollars in avoided losses (Cabot Venton, et al. 2012, 48).

Summary of Key Points

- Effective resilience programming takes a holistic, multisectoral approach, building absorptive, adaptive, and transformational capacities at the individual, household, community, national, and systems levels.
- Most resilience activities that target individual-level change focus on asset accumulation, income diversification, and social protection. This narrow focus fails to address all five lenses of youth development (physiological, psychosocial, socioecological and sociocultural, economic, and policy and systems).
- One glaring gap in the literature on resilience is the lack of acknowledgment that **living in poverty may introduce stressors (and physiological reactions) that inhibit cognitive and physical development, which form the basis of knowledge and skills—two key individual-level asset pools. In addition, conflict, violence, living without parental care, migration, and other life-changing events may further delay psychosocial development.**
- The individual attributes that serve as protective factors, i.e., characteristics that promote resilience, are **contextually unique and socioculturally bounded**.
- **A supportive socioecological context may be equally or more important to an individual's resilience than individual attributes**. This should be kept in mind when designing interventions. Forms of engagement may also vary with context.

- **The debate around economic diversification vs. economic specialization at the individual level remains unresolved, in part because of the lack of information on risk tolerance or decision-making processes within households (and the extent to which youth have a voice or how their needs are taken into account).** Complicating the discussion on risk tolerance and decision-making processes is the fact that youths' decision-making and risk-assessment skills may not be fully developed until their mid-to-late-20s, putting them in a suboptimal position to make informed decisions about their risk tolerance until that time.
- **While cash transfers reduce poverty in the short term, only social protection plus economic inclusion programs (also known as cash-plus programs) or broader economic inclusion programs using bundled interventions have a sustained impact on income, assets, and savings**. While these types of activity align well with a PYD lens and should be effective in supporting youth to achieve GFSS goals, comprehensive cash-plus programs are currently prohibitively expensive, as well as difficult to sustain and scale up. Additional research is needed on the complementarity of interventions to determine how to best achieve food security goals at scale.

Objective 3: A Well-Nourished Population, Especially among Women and Children

The third objective of the GFSS is a well-nourished population, especially among women and children. As stated in the GFSS, good nutrition of populations is central to sustainable development and is required to make progress on a broad range of development issues, such as health, education, employment, reduction of poverty and inequality, and the empowerment of women and girls. Malnutrition among youth, including undernutrition, overweight and obesity, and micronutrient malnutrition, restricts their potential and productivity, and imposes a high burden of social and economic consequences on them, as well as on their families, communities, and nations.

This objective reflects the zero-hunger goal of SDG 2 but goes further in its recognition that providing adequate calories alone is not enough. While hunger can be addressed through the consumption of starchy staples, taking this approach without regard for the overall nutrient adequacy of diets does not result in the best cognitive and physical development outcomes (Hoddinott and Horton 2014) nor does it fully address the causes of malnutrition. Thus, this objective focuses on nutrition more broadly, going beyond SDG 2 to incorporate SDG 3 Good Health and Well-being, ensuring healthy lives and promoting well-being for all at all ages.

Research shows the most critical period of human development is from pregnancy to age two (referred to as the first 1,000 days of life), as it establishes the foundations for physical growth and neurodevelopment, and this timeframe is the focus of many USAID nutrition programs. Later childhood and adolescence are also important for additional growth and development – on average, 10-19-year-olds gain 20% of their adult height and 50% of their adult weight during adolescence (Baxter-Jones 2011). In addition to being the life stage for achieving adult stature, adolescence is the life stage in which cognitive and psychosocial development accelerates as well. Further, despite the conventional wisdom that once dictated that losses in growth in the first two years of life could not be regained later, **recent evidence shows that some catch-up growth may be possible by age 20-23 for those who experienced linear growth faltering in the first two years of life** (Christian and Smith 2018). However, gaps in the evidence base leave questions regarding the conditions under which optimal catch-up growth can occur, and the limits to which growth faltering in the first 1,000 days can be remedied (ibid). Furthermore, the evidence of catch-up growth is strongest among adolescents for whom socioeconomic and living conditions are also improved (Leroy 2020), indicating a need for coordination across a broad range of development sectors.

Suboptimal linear growth in adolescence represents a significant health concern for the approximately 16 million adolescent women who become mothers every year in lower- and middle-income countries, particularly in groups that are socioeconomically disadvantaged or disproportionately facing nutrition challenges such as rural and indigenous populations (UN 2015, WHO 2020). Adolescent pregnancy poses the double risk of causing or exacerbating malnutrition in mothers through maternal stunting[12] and competition for nutrients between the mother and fetus (Scholl and Hediger 1993, Hsu 2016), and perpetuating intergenerational malnutrition through negative nutrition outcomes for their children, who are at increased risk of low birthweight and short birth length. Maternal stunting is a risk factor for poor pregnancy outcomes, such as fetal growth failure, poor birth size, and preterm birth, perpetuating intergenerational cycles of growth failure (Christian and Smith 2018; Kozuki 2015; Black 2013). Low maternal folate, vitamin B12, and vitamin D during pregnancy have been associated with reduced cognitive function and greater future risk of diabetes in children (Norris et al. 2021). Mothers with overweight or obesity face an increased risk of developing gestational diabetes, which in turn increases the child's risk of increased adiposity and insulin resistance, high blood pressure, and early onset type 2 diabetes (Norris et al. 2021).

Beyond stunting and suboptimal linear growth, the substantial transformation and maturation of all organs and physiological systems seen in adolescence strongly ties adolescent nutrition with long-term health outcomes. Through late adulthood and early adolescence, nutrition status plays a key role in the timing and pattern of puberty, which affects adult height, muscle, and fat mass accrual, and risk of non-communicable diseases later in life (Norris et al. 2021). The considerable brain growth and development that occurs during adolescence leaves the maturing brain susceptible to detrimental effects of poor nutrition. Neurodevelopment in adolescence is linked to the maturation of other body systems, particularly the gastrointestinal system and the musculoskeletal system (responsible for a bone-derived hormone, osteocalcin, linked to anxiety and depression, as well as exploration, spatial learning, and memory) (Norris et al. 2021). Diets high in fat and sugar may affect neurodevelopment in ways that lead to long-term dysregulated eating and impulsive behaviors, exacerbating overweight and obesity (Lowe 2020). Undernutrition has been linked to interrupted pubertal development and impairment of cognitive flexibility and working memory, with extended undernutrition resulting in a reduction in gray and white matter of the brain (Scharner and Stengel 2019).

According to the World Health Organization (WHO), **micronutrient deficiencies (and particularly iron deficiency leading to anemia, iodine deficiency, and Vitamin A deficiency) are a significant source of growth deficiency and years lost to disability** (see Key Lessons on How Youth Become Healthy Adults section below). While iron and iodine deficiencies tend to be higher among adolescent women, Vitamin A deficiencies seem to be higher among adolescent men (Christian and Smith 2018). Undernutrition also affects the endocrine system, producing higher levels of stress hormones and lower levels of hormones that regulate growth (Lassi, Moin and Bhutta 2017). In addition, consumption of healthy foods, particularly fruits, vegetables, and lean meats, is often insufficient, with adolescents consuming more foods high in saturated fats, trans-fatty acids, sugar, and salt (World Health Organization 2021). These patterns have resulted in increasing obesity among adolescents worldwide, resulting in a double burden of both undernutrition and overweight among adolescents (Lassi, Moin and Bhutta 2017).

In addition to the scientific considerations around nutrition, nutrition is dependent on behaviors that are influenced by many things, including social norms. Nutrition interventions for adolescents must be designed with consideration for adolescents' unique emotional development, sense of identity, and values. For instance, **a randomized experiment by Bryan et al. (2016) found that healthy**

[12] Stunting refers to being short relative to one's age—a height more than two standard deviations below the World Health Organization Child Growth Standards median. Stunting is generally associated with socioeconomic factors.

eating behavioral interventions targeting adolescents in high-income countries were more effective when aligned with values such as autonomy from adult control (agency in the PYD framework) and the pursuit of social justice (contribution in the PYD framework). Psychosocial development and identity work during adolescence (see Key Lessons on How Youth Become Healthy, Engaged, Productive Adults) may influence food habits and lifestyle choices in positive or negative directions, and ultimately set the stage for adulthood (Bonnie et al. 2019; Brooks 2014).

Key Issues around Durability, Scale, and Sustainability

Some nutritional outcomes, such as treatment of severe acute malnutrition, improving dietary diversity, and micronutrient supplementation and fortification, can be achieved rapidly. Reduction of stunting, however, typically requires a longer timeline. Nevertheless, nutrition activities are promoted as some of the most effective interventions in terms of cost-effectiveness and rate of return. For example, Hoddinott and Horton (2014) calculated the economic impacts of reduced stunting by following individuals in Guatemala over 20 to 30 years and comparing the hourly earnings, hours worked, marital status, migration patterns, household consumption, and other variables of those who were stunted as children with those who were not. Those who were not stunted at age three had household consumption 66 percent higher in adulthood when controlling for confounding variables. Given those results, and using a cost estimate generated by other scholars, Hoddinott and Horton (2014) estimate that the return on investment for nutrition interventions ranges from 3.5:1 to 42.7:1, depending on national economic conditions. Thus, **investments in nutrition are not only cost-effective but also durable (i.e., early interventions can have long-ranging results)**. Given the lack of information on adolescent nutrition interventions, estimates for returns on investments are not readily available.

The lack of consistent investment in adolescent-responsive nutrition programs and research (Norris et al. 2021) has resulted in an incomplete evidence base for designing nutrition programs for adolescents. Many studies rely on demographic and health survey data that focus on women of reproductive age (15-29), thus missing younger and male adolescents. In particular, the evidence base is missing longitudinal dietary, anthropometry, and micronutrient status data, as well as global indicators for health and nutrition in adolescents. Similarly, interventions are currently designed without the benefit of data on key growth factors (e.g., age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization)[13] in many low- and middle-income countries (Christian and Smith 2018).

Of the evidence that does exist regarding interventions targeting adolescent nutrition, studies generally fall within four categories of intervention settings: Schools, healthcare, and food systems.

Nutrition Interventions in School Settings

In education settings, the most common and long-standing intervention is school meals. Historically, school meal programs have led to minimal effects on dietary change or nutrition outcomes (Lassi, Moin, et al. 2017). However, more recent approaches to school meals aim to improve upon earlier implementation shortcomings through policy directives banning ultra-processed foods (Pérez-Ferrer et al. 2018), incorporating more nutrient-dense and fortified foods into school menus (Andretti, Goldszmidt, & Andrade 2021), and targeting choice architecture to improve the appeal and selection of said nutrient-dense menu options (Quinn et al. 2018; Olfert et al. 2019). Beyond the provision of meals, schools also provide a site for distribution of supplements such as multiple micronutrient supplements, protein/energy supplements, and weekly iron and folic acid supplements for adolescent girls, though these programs have been implemented in only a few countries, and evidence in most countries does not show significant reductions in adolescent anemia with school-based iron supplementation programs (Azzopardi et al. 2019; Salam et al. 2020), likely due in part to the complexity of the multiple causes of

[13] These factors are critical for establishing normal and abnormal growth patterns in a specific population.

anemia and variations in these causes across contexts (Petry et al. 2016). Schools have also served as settings for nutrition education and counseling interventions, but with little evidence evaluating their effectiveness (Salam et al. 2020). Overall, there is an increasing recognition that school-based interventions may be most successful at improving adolescent nutrition outcomes if part of a "whole school approach" to nutrition promotion (Rowe, Stewart, & Somerset 2010), including by embedding nutrition education into classroom curricula, facilitating physical activity during school, supporting the monitoring, screening, and treatment of nutrient deficiencies, and reinforcing nutrition messages through individual engagement by school staff (Jacob et al. 2021).

While many young adolescents are reached by school-based nutrition interventions in primary schools, these programs do not focus on secondary education, and secondary enrollment and attendance drop off significantly among the secondary school age population in sub-Saharan Africa. As of 2021, 37% of the secondary school age population in sub-Saharan Africa never attend school, and still others do not attend regularly (World Bank n.d.). Yet **reaching adolescents outside of school remains critical, so that those who lack access to education are not also losing access to nutrition interventions.** Some weekly iron and folic acid supplement distribution programs have attempted to reach out-of-school adolescents with networks of peer support groups and women's self-help groups (Hargreaves et al. 2021), and by linking in-school promotion of supplements with distribution at clinics outside of schools that are accessible to parents of students, siblings, and neighbors (Chong et al. 2016).

Nutrition Interventions in Healthcare Settings

Healthcare settings are an important component of population-wide nutrition strategies, and this remains the case for adolescent nutrition. Health professionals can provide nutrition information to adolescents and implement locally and individually appropriate malnutrition screening and treatment programs. Individual and group primary care interventions for overweight and obese adolescents typically include nutrition advice and supervised diet programs, motivational interviewing, physical activity interventions, and combinations thereof (Hargreaves et al. 2021). Such primary care interventions tend to be more effective when they include a behavior change or psychological component (Lassi, Moin, et al. 2017; Moores et al. 2018), engage family members (Thomason et al. 2016), and are of longer duration and higher intensity (Wickham & Carbone 2018). Furthermore, some studies show physical activity interventions organized or delivered by peers result in greater engagement and retention among adolescents than adult-led activities (Kornet-van der Aa et al. 2017). To be maximally effective, interventions must be tailored to local contexts and the needs of the adolescents being targeted, rather than designed around assumptions about all adolescents.

While interventions in schools and healthcare settings are key tools in improving adolescent nutrition, youth still contend with factors outside of these environments such as the social norms and physical environment that constitute the world in which they live and make choices. Many of the most effective interventions for adolescent obesity are tailored to specific social contexts and designed to be delivered in community settings (Moores et al. 2018), though the broader evidence base evaluating community programs is limited.

Nutrition Interventions in the Broader Food System

Another key environmental factor that influences youth nutrition is the broader food system. Strong associations have been found between the proximity of fast-food restaurants to commuting routes to schools and the purchasing of calorie-dense foods by Canadian adolescents (Sadler et al. 2016), and higher prevalence of convenience stores near schools has been associated with greater obesity among students in China (Zhou et al. 2020). This aspect of food environments can be influenced by local governments through zoning laws. Beyond the location of restaurants and food retailers, agriculture policies exert significant influences on the availability, abundance, and affordability of nutrient-dense foods and competing ultra-processed foods (Gillespie et al. 2019), and ultra-processed foods being

cheaper than nutrient-dense foods is a pattern consistently seen around the world, particularly in areas with the highest rates of stunting (Headley & Alderman 2019). In many contexts, adolescence is a period of transition from depending on families for food to making food purchasing decisions for oneself, and much of the evidence evaluating food environment interventions focus on consumer food purchasing behavior that is not specifically targeted to adolescents.

While the evidence detailed above indicates potential for single interventions to have impacts on adolescent nutrition, a piecemeal and fragmented approach of narrowly focused interventions is unlikely to achieve the greatest lasting change. A growing consensus in the field of maternal and child nutrition recognizes that integrated interventions offer stronger evidence of robust and durable improvements (Keats et al. 2021). To date, interventions for adolescents have focused largely on single micronutrient supplements and have failed to tackle the multiple factors that lead to malnutrition and poor diets (Norris et al. 2021). Instead, coordinated interventions that break silos and span multiple sectors are needed to address a challenge as complex and multifaceted as adolescent nutrition. A limited number of broad, multi-sectoral interventions targeting adolescents with rigorous monitoring exist, but most are in high-income country contexts. Further evidence is needed to evaluate the effectiveness of multi-sectoral interventions targeting adolescent nutrition, and in a greater range of contexts globally.

Other scholars agree on the importance of addressing substantial gaps in the knowledge base regarding adolescent nutrition, particularly as many studies rely on demographic and health survey data that focus on women of reproductive age, thus missing younger and male adolescents. In particular, the evidence base is missing longitudinal dietary, anthropometry, and micronutrient status data, as well as global indicators for health and nutrition in adolescents. Similarly, interventions are currently designed without the benefit of data on factors associated with the age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization in many low- and middle-income countries (Christian and Smith 2018). Thus, **the knowledge base for designing nutrition programs for adolescents is very incomplete**.

Nutrition Interventions at Scale

Over the past several years, a great deal of effort has been dedicated to understanding how to achieve nutrition goals at scale. There is little clear evidence, however, related to youth. Based on recent evidence, **it is unclear whether schools are a viable platform for scaled-up nutrition-specific interventions** (Salam et al. 2020). Such approaches exclude out-of-school youth, who are likely among the most food-insecure, as well as youth who do not attend school regularly even if enrolled. Most nutrition-specific interventions are delivered through a country's health sector, but the data collected are generally limited to pregnant adolescents or young women of reproductive age. Food systems data is also scarce. Shekar, Dayton Eberwein, and Kakietek (2016) identified 10 successful nutrition interventions that had strong evidence and a WHO protocol for scaling up, but only two of those were targeted to individuals over the age of five years: iron fortification of staple foods and salt iodization (to address iron and iodine deficiencies, respectively). Those two approaches work within the food processing stage of the food system and do not target youth specifically.

Key Lessons for Poverty Reduction

Despite the increasing knowledge base about what works in achieving nutrition-specific outcomes, **none of the most recent evidence indicates that nutritional improvements are sufficient to reduce poverty**. The economic impacts of nutrition-specific interventions assume three primary channels of influence: (1) a direct effect on wages due to increased physical productivity, (2) an indirect effect on wages due to improved cognition leading to higher educational attainment and, hence, wages, and (3) an indirect effect through reduced chronic disease in adulthood, which, in turn, minimizes wages lost due to illness and disability (Hoddinott and Horton 2014). While there is a logical argument that increased physical and cognitive productivity should lead to increases in household consumption, the

FAO (2019) cites inequality (defined as income inequality, inequality in access to basic services, inequality in access to productive assets, marginalization, and inequality within households) as a key issue in reducing poverty, and particularly severe poverty. Taking the GFSS as a holistic approach, however, better addresses this issue, which will be discussed below.

Summary of Key Points

- **Investments are needed to provide more and better data on what nutrition programming works for youth and why.** The evidence gap regarding specific nutrition needs in young adolescents (ages 10-14), older adolescents (ages 15-19), and young adults (ages 20-24) inhibits the design and development of youth-targeted interventions to improve nutrition (and other) outcomes. More effective interventions may depend on conducting additional research to establish population norms (for example, for age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization) and effective approaches in specific sociocultural contexts. Youth engagement strategies should be more specific about the subgroups they are engaging and why.
- **Adolescence is a time of high nutritional needs given the significant physical and cognitive development that occurs in this life stage and is also a window of opportunity for catch-up growth**. Catch-up growth can support improvements in cognitive development at this critical juncture. **Failing to address nutrition deficits in adolescence – particularly in the context of adolescent pregnancy – risks entrenching intergenerational malnutrition.**
- **The current evidence supports expanding nutrition education and micronutrient supplementation/food fortification focusing on iodine, iron, zinc, and vitamin A for adolescents.** In addition, in communities and households where food insecurity is chronic, macronutrient supplementation may be appropriate. **Nutrition education is particularly important as food preferences and habits are formed in adolescence.**
- Investments in nutrition are **durable and** appear to be **cost-effective**; however, specific rates of return for adolescent nutrition interventions are not readily available.
- To achieve nutrition goals, **it is necessary to reform food systems. Expanding rapid and cold-storage supply chains**, in particular, can increase the availability of varied, healthful fresh food and lessen people's reliance on heavily processed packaged food items.
- Despite its importance to physiological and cognitive development, improved nutrition alone is not sufficient to reduce poverty. It is, however, an **important factor in a holistic approach to poverty reduction**, as discussed below.

Linkages and Synergies across GFSS Objectives

The GFSS objectives, although sometimes pursued as stand-alone areas of programming, are frequently approached through multi-pronged activities that focus on multiple layers of challenges. Many USAID Feed the Future activities engage rural youth, and young women in particular, whose assets and opportunities are constrained by their location, socioeconomic status, social norms, educational attainment, generational vulnerabilities (such as maternal malnutrition leading to stunting and exposure to violence), and lack of access to markets. For example, activities focused on enhancing production among youth farmers also incorporate elements of household resilience programming and nutrition-sensitive approaches to agriculture to mitigate existing vulnerabilities and marginalization. The evidence base on the effect of these multi-pronged approaches to poverty reduction is currently limited largely to analyses of the impacts of nutrition-sensitive agriculture on nutritional outcomes on children or on children and mothers.

Based on the lessons from other sectors, however, it's reasonable to expect that for interventions to be successful, in addition to being tailored to adolescents' stage of psychosocial and physiological development and values, they must be tailored around the participants' age, sex, socioeconomic conditions, urban or rural geography, and social and cultural contexts, reflecting the diversity of adolescents as a population. Another key consideration, however, is how youth are positioned to enact changes in the food system.

Youth as Change Agents in the Food System for Improved Nutrition Outcomes

Youth are not merely targets and recipients of nutrition interventions. The specific roles that youth play in food systems vary by location, age, gender, socioeconomic status, and context, but overall youth are engaged in a wide range of on- and off-farm food system activities, such as production, processing, transportation, and sales of food in a variety of venues (Yeboah et al. 2020). In recent years, researchers and programmers have gained experience and learnings about working with young people to increase youth employment within the agriculture sector.

A recent global study (Dolislager 2021) aggregated labor data (hours worked in specific occupations) from household surveys conducted between 2010 and 2018 in 13 countries in Africa, Asia, and Latin America[14] and found substantial employment of youth in the agri-food sector, as shown in Table 1 below. Employment included own farm work (working on own or family-owned land for sale or consumption), wage farm work (paid work on farms other than family), and post-farm work (processing, packaging, distribution, retail, etc.) within the agri-food system. Combined employment for all youth in agri-food systems (rural and urban, and based on full-time equivalents (FTE) of youth workers) amounted to 71% in sampled African countries, 48% in sampled Asian countries, and 40% in Latin American countries.

Table 1: Youth and adult shares of full time equivalents in agri-food systems in 13 countries (percent)

	Africa Urban	Africa Rural	Africa Total	Asia Urban	Asia Rural	Asia Total	LAC Urban	LAC Rural	LAC Total
Youth own-farm	11	51	46	1	19	14	0	12	7
Youth farm wage	1	4	3	2	13	9	1	16	9
Youth post-farm	29	21	22	32	21	25	26	23	24
Adult own-farm	5	36	31	3	28	20	0	17	8
Adult farm wage	1	3	3	2	13	9	1	11	6

[14] The sampled countries included Ethiopia, Malawi, Niger, Nigeria, Tanzania, Uganda, Bangladesh, Cambodia, Indonesia, Nepal, Mexico, Nicaragua and Peru.

Adult post-farm	31	24	25	26	17	20	21	21	21

Source: Table 3, Dolislager et al 2021.

Given the extent of their participation and the variety of their roles in agri-food systems, youth are key to their transformation. Furthermore, youth also play roles in influencing peers' behavior and shifting attention to social issues. Reflecting this, the 2017 High-Level Panel of Experts framework on sustainable food systems has been adapted to incorporate youth as change agents in the transformation of food systems (HLPE 2021). A survey of high-income consumers found that 59% of participants followed social influencers on social media platforms, and that 16% of participants reported influencers as having a significant role in determining their food choices (Byrne 2017), and some evidence indicates that incorporating social media components into nutrition interventions may positively impact outcomes (Chau et al. 2018). In terms of social issues, evidence generated from a web-based survey among 20,000 young adult university students found social justice issues around sustainable food systems and nutrition to have gained significant attention among youth in recent years (Nikolaou 2020). Act4Food is one example of a youth-focused advocacy campaign, with its participants having taken a lead role at the United Nations Food Systems Summit in late 2021 and creating a food systems pledge intended to spur leadership and activism among youth towards more sustainable food systems in their communities and contexts. Examples of other youth-led and/or focused initiatives include Youth Excel, the United Nations' Major Group for Children and Youth, the Global Indigenous Youth Caucus, and the Scaling Up Nutrition (SUN) Civil Society Network's Youth Leaders for Nutrition program.

Summary of Key Points

- Youth are not merely targets and recipients of nutrition interventions but play important roles throughout food systems and are key to their transformation. Youth are particularly well positioned to drive the adoption of new technologies and practices, and to influence peers' food choices and attention to social issues related to food systems in ways that improve access to healthy diets.
- Program design should more intentionally build in learning questions to better understand effective approaches of engaging young people in food systems activities to improve diets and nutrition.

Discussion

One of the significant findings of this review is that the bodies of literature related to agriculture-led growth and resilience generally come from distinct academic and practitioner communities, and they rarely effectively engage with content from the other (though both engage with literature on nutrition to some extent). Thus, there is less exploration than might be useful of trajectories for poverty reduction that incorporate both economic growth and deployment of effective, fiscally viable social protection measures. In addition, neither fully addresses the political processes that shape policy decisions around investment for economic growth or prioritization of social protection schemes. These political processes frequently contribute to or replicate inequality and inequity in access to resources and illuminating those processes (and their points of inclusion and exclusion, particularly for marginalized groups) more fully would be helpful in designing more effective approaches to poverty reduction.

Despite these challenges, important contributions to the global knowledge base regarding poverty reduction and nutrition over the past several years could have important impacts on USAID's poverty and hunger reduction activities and how it engages youth in those activities. Below we summarize a few key considerations.

USAID defines extreme poverty as "the inability to meet basic consumption needs on a sustainable basis. People who live in extreme poverty lack both income and assets and typically suffer from interrelated, chronic deprivations, including hunger and malnutrition, poor health, limited education, and marginalization or exclusion" (USAID 2015). However, its theory of change for ending extreme poverty is multi-faceted and incorporates programming across its portfolio. As such, USAID measures not poverty reduction but changes in the factors that contribute to poverty (malnutrition, child mortality, youth illiteracy, energy poverty, consumption poverty, primary school gender gap, etc.). In addition, information on poverty incidence is often included as background information for activity documents, but it is never reported as an outcome of activities. As a first step in addressing this issue, USAID might decide whether to focus on the overall incidence, depth, or severity of poverty. Whether the focus is decided at a global or country level, increased clarity on the intended activity outcomes will assist USAID and its implementing partners in targeting participants and designing interventions.

USAID may also want to consider differentiating its approach depending on a country's level of development. Some researchers have argued that market systems development approaches, which focus squarely on market systems to drive agricultural productivity, have not yielded the benefits expected in sub-Saharan Africa, for example (Metelerkamp, Drimie and Biggs 2019). Strategies that focus on agricultural productivity through mechanization, extension, and other interventions (Mellor 2017) (and are aligned with USAID's 2021 Economic Policy), for example, might be more critical at an earlier stage of development than market systems, and sequencing key interventions might yield better results. At the same time, interventions in these areas can be approached through a systems lens to address scale, sustainability, competitiveness and inclusion.

Relevant Lessons from Youth Development Literature

Despite meaningful attempts to understand how to reduce poverty and increase resilience, the evidence base remains incomplete. For example, data on the efficacy of interventions by subgroup—particularly for youth as related to intrahousehold allocation, generation, and acquisition of resources—are sparse and not well documented. Therefore, it is also useful to review the literature on youth development to see what it can contribute, at least in theoretical terms, to our understanding of how poverty reduction and resilience activities can yield the strongest possible results for youth. The discussion that follows is organized around the various lenses of youth development: (1) physiological development, (2) psychosocial approaches, (3) sociocultural and socioecological approaches, (4) behavioral and labor economics, and (5) policy systems/rules.

Physiological Development

The physiological development of an individual is the first lens through which adolescent development might be considered. Though for medical purposes adolescence is often defined as the period from the onset of puberty until the end of pubertal growth, there are no fixed global standards for what is considered normal adolescent development. In fact, normal physiological growth falls within two standard deviations of a 95 percent confidence interval for a specific population, meaning that what is normal depends on a wide range of genetic, environmental, and energy intake and expenditure factors (Rogol, Clark and Roemmich 2000). In addition, the exact ages encompassed by adolescence typically vary by sex (with girls usually experiencing the onset of puberty younger than boys) and by a range of additional determinants, as studies across countries have identified differences of a year or more in the age of onset of puberty, and studies within countries have shown differences within subpopulations of girls, in particular (Abbassi 1998).

To understand differences in populations' pubertal growth patterns, studies of adolescent development typically capture age at take-off (i.e., the onset of puberty), height at take-off, age at peak height velocity (i.e., rate of the fastest growth in stature), peak height velocity, duration of puberty, and the

contribution of the pubertal height gain to final height (Abbassi 1998). However, as referenced above, Christian and Smith (2018) noted a paucity of data on factors associated with the age of onset of puberty, peak height velocity, and duration of linear growth in many low- and middle-income countries. Since these critical data are unavailable for many countries in which USAID operates, it is useful to explore how generalized knowledge about adolescent physiological development can contribute to our understanding of how to engage youth effectively.

Key Lessons on How Youth Become Healthy Adults

Adolescent growth spurts generally result in significant increases in height, weight, muscle mass, and bone mineral content (Rogol, Clark, and Roemmich 2000). In addition to an increase in caloric (i.e., macronutrient) intake, adolescents need four specific micronutrients to support cognitive and immune system development: iodine, iron, zinc, and vitamin A (Qureshi, Dixon, and Wood 2015). At a minimum, youth need sufficient quantities of diverse, safe, healthy food and those targeted micronutrients for healthy physical development.

As with the body, the brain undergoes physical changes in adolescence, with significant growth in the cerebral cortex and strengthening of linkages between nerve cells in the brain that continues into an individual's early 20s (Harvard Medical School 2011). The hormones responsible for these changes—particularly growth, gonadal, and adrenal stress hormones—help us understand behavioral changes in adolescence. Sex hormones, for example, affect risk-taking, sensation-seeking, and sensitivity to reward. One key finding in recent research is that environmental stimuli can induce hormonal reactions. A recent study, for example, found that bullying affects the amount of testosterone adolescents produce (i.e., more in boys and less in girls), which may impact behavior, as well as interactions with other hormones (Peper and Dahl 2015). Some researchers have also found that an excess of stress hormones can negatively influence cognitive and other forms of development (Lassi, Moin, and Bhutta 2017). Several scholars have suggested that more research is necessary to understand connections between hormones, brain development, and behavior in adolescents.

Youth who enter adolescence in poor health resulting from childhood malnutrition or illnesses may face ongoing challenges. Scholars suggest that worldwide, the most common cause of growth retardation is poverty-related malnutrition, which can take the form of hunger overall or the lack or malabsorption of key foods (e.g., protein) and nutrients (e.g., zinc, iron, and vitamins) (Rogol, Clark, and Roemmich 2000). These nutritional gaps can lead to an increase in lethargy or a decrease in physical activity, as the body attempts to reduce energy losses. Continued malnutrition during adolescence increases the potential for nutrition-related illnesses among adolescents, including meningitis and rickets (Hume-Nixon and Kuper 2018), as well as edema, anemia, and a range of vitamin deficiencies (Rogol, Clark, and Roemmich 2000).

Disability is a related issue among adolescents. While disability rates among adolescents are frequently perceived to be fairly low, a recent study revealed that among 15 to19-year-olds in lower- and middle-income countries, the rate of disability was 13.9 percent, taking into account epilepsy, intellectual disabilities, and sensory impairments and excluding physical impairments, which is a considerable increase from earlier estimates (Olusanya, et al. 2020). As the disability rate for infants was 6.1 percent, the more-than-doubling of disability prevalence by the age of 19 raises key questions around the causes of increased prevalence and the extent to which early interventions in childhood and adolescence might reduce this prevalence. A key contributor to disability can be childhood malnutrition, which can result in neurodevelopmental disorders and contribute to sensory impairments (Hume-Nixon and Kuper 2018; Rogol, Clark and Roemmich 2000; Kerac, et al. 2014). These challenges reduce the opportunities for youth to participate fully in their communities and contribute to their nations' development.

Lessons on Durability, Scale, and Sustainability

Physiological development during adolescence determines the stature of individuals for the rest of their lives. Interventions that support healthy physiological development, in general, have a fairly high rate of

return, based on the literature from childhood interventions. As noted above, while it used to be thought that undernutrition before the age of two could never be ameliorated, more recent evidence shows that some catch-up growth in the pubertal growth spurt may be possible (Christian and Smith 2018). The gaps in the current knowledge base, however—particularly in terms of longitudinal, dietary, anthropometry, and micronutrient status data, and global indicators for health and nutrition in adolescents—leave many questions about the conditions under which that might occur and the limits of catch-up growth (Christian and Smith 2018).

In addition, the current knowledge base on effective interventions for adolescents is limited and focuses primarily on nutrition rather than broader physiological development. As noted earlier, a recent meta-analysis of adolescent nutrition interventions yielded very little information about efficacy (Salam, et al. 2020). Christian and Smith (2018) identified a need for rigorous evaluations of nutritional interventions to determine the right combination and dosage of macro- and micronutrients as well as age and duration for intervening to enhance optimal growth and development outcomes in adolescence and later-in-life outcomes. However, the research on the developmental impact of hormones under a range of conditions that are common in low- and middle-income countries is insufficient. Scholars of physiological development also identify research gaps concerning the influence of family composition, social class, urbanization, and climate in addition to the nutritional and hormonal factors that influence development (Tanner 1990). Although their work does not fully address this gap, scholarship in the psychosocial and sociocultural traditions, which is the topic of the next section, can provide another lens that addresses some of those concerns.

Summary of Key Points

- There are no fixed global standards for what is considered normal adolescent development. "Normal" physiological growth varies by population, meaning that genetic, environmental, and energy intake and expenditure factors must be used to determine normal ranges. A dearth of information on longitudinal, dietary, anthropometry, and micronutrient status data in many low- and middle-income countries inhibits analysis and reporting of adolescent nutrition statistics.
- Contrary to earlier evidence, recent evidence shows that some catch-up growth in the pubertal growth spurt may be possible with proper nutrition.
- Little evidence is available on the efficacy of youth-focused nutrition interventions.

Psychosocial Approaches

As noted above, adolescence is a time of significant brain development, as well as the time an individual achieves sexual maturity. This section on psychosocial approaches includes the schools of thought that focus on the internal psychological processes of an adolescent's development. Adolescents embark on the process of identity formation at this stage—determining who they want to be as adults—and this process can produce multiple identities corresponding to different environments (i.e., school, work, religious organization, family, community) (Berger 2008).

Key Lessons on How Youth Become Healthy, Engaged, Productive Adults

According to Erikson's (1968) stages of psychosocial development, adolescence and young adulthood encompass two critical psychosocial-developmental phases: the formation of identity and the entry into intimate and supportive adult relationships.[15] The formation of identity is often divided into periods of exploration and commitment. During the exploration phase, youth grow into their adult bodies and may develop new interests and try new activities to learn about and reflect on personal values, ethics, and

[15] Erikson's eight stages of psychosocial development are: (1) trust vs. mistrust (infancy); (2) autonomy vs. shame/doubt (ages 2-3); (3) initiative vs. guilt (ages 3-5); (4) industry vs. inferiority (ages 6-11); (5) identity vs. role confusion (ages 12-18); (6) intimacy vs. isolation (ages 19-40); (7) generativity vs. stagnation (ages 40-65); and (8) ego identity vs. despair (ages 65+). It is useful to note that interrupted or delayed development in earlier stages can postpone readiness for subsequent stages.

goals. In this phase, adolescents make durable life decisions, including how far and in what areas to pursue education, early career choices, and worldviews. Another important aspect of this transition is the shifting from parents and family to peers as the primary reference markers (for a wide range of attitudes and behaviors, including dietary choices). A critical outcome of this phase is alignment with the standards and expectations of the social group to which an individual belongs (Erikson 1968). A strong sense of identity can foster resilience and help youths interact confidently within family and society, reducing anxiety. An overdeveloped sense of identity, however, can lead to fanaticism, resulting in unhealthy interactions with others (Orenstein and Lewis 2020).

As adolescents transition into young adulthood, they enter the next phase of psychosocial development: entry into intimate and supportive adult relationships as they begin to form durable bonds outside of their families. While much of the literature on this phase focuses on romantic relationships, friendships, mentorships, and other close bonds are also critical. Failure to achieve those bonds results in isolation (Erikson 1968).

Jean Piaget was another major theorist in the psychosocial tradition who focused specifically on cognitive development. Piaget divided the cognitive development process into four stages: (1) sensorimotor (ages 0-2), (2) preoperational (ages 2-7), (3) concrete operations (ages 7-11), and (4) formal operations (age 11 – adulthood). According to this classification, **adolescence encompasses the transition from concrete operations to formal operations, including the development of problem-solving and deductive-reasoning skills, metacognition, and the capacity for abstract thought** (Berger 2008). Identity work rests on this transition to formal operations and, particularly, the capacity for abstraction. Kegan (1982) refined the formal operations category Piaget proposed into three distinct stages: (1) interpersonal (i.e., a key focus on mutually reciprocal one-to-one relationships), (2) institutional (i.e., group involvement in career, entry into the public/political space in the community), and (3) interindividual (i.e., genuinely adult loving relationships). This refinement sequences adult relationships into three kinds, highlighting the importance of work and public spaces in the psychosocial development of young adults.

Piaget, Kegan, and many of their contemporaries' studies were critiqued by cognitive development experts for their assumption that maturation occurs concurrently across domains of knowledge, which is not supported by the variability in children's and adolescents' academic performance. In addition, more recent neurological research shows that **while children develop and integrate knowledge simultaneously, this does not occur simultaneously across domains of knowledge** (Bjorklund 2018).

Another key limitation to these theories is that they assume a relatively stable environment—from parental behavior to political stability—which is not the case for many adolescents. In addition, youth in any country may experience traumatic events, such as natural disasters, interpersonal violence, accidents, injuries, or the unexpected loss of a loved one. Therefore, it is important to also examine the literature on the effects of instability, stressors, and trauma on adolescent psychosocial development.

The primary outcomes of trauma or endemic stressors in the lives of adolescents are a range of mental health issues: post-traumatic stress symptoms, depressive symptoms, anxiety symptoms, and externalizing behavior problems (Dorsey, et al. 2016). Significant scholarship has focused on the psychosocial impacts of trauma or stressors, as well as those individual and contextual characteristics that protect youth from the impacts of trauma or promote well-being despite trauma, as detailed below.

For example, two reviews focused specifically on studies of adolescents in low- and middle-income countries affected by armed conflict. Across diverse settings, resilience emerged from personal strengths and supportive contexts; but which strengths and what types of supportive context were most critical

for resilience varied across contexts. The authors of both reviews observed that **perceptions of adaptive outcomes among youth were contextually unique and socioculturally bounded**. Overall, individual attributes and contextual characteristics were only influential by gender, by symptom, or by phase of conflict. Nevertheless, evidence has shown that youth exposed to conflict can be treated effectively in low-resource settings even when stability has not been fully restored (Klasen and Crombag 2013). One review concluded that "a supportive socio-ecological context is at least as important—if not more important—a determinant of resilience as intra-individual variables and should thus be a central focus for interventions promoting resilience" (Tol, Song, and Jordans 2013, 458). Further, the authors remarked that externally defined indicators for resilience are likely to fail to accurately identify critical resilience outcomes and their predictors (Tol, Song, and Jordans 2013).

Non-conflict-related traumas may not follow the same pattern, however. A recent study compiled evidence on mental health interventions with children and adolescents in street situations (i.e., living without parental care or permanent housing) exhibiting the same mental health conditions discussed above. The study compared the efficacy of a range of interventions, which included a multidisciplinary-care approach, a residency step program, resilience training, psychodrama, and forensic offender-rehabilitation narrative-exposure therapy, all of which were impactful in improving the mental health and well-being of street youth, both female and male. Resilience training, psychodrama, and a multidisciplinary-care approach were most helpful in addressing emotional regulation and externalizing behavior problems. However, none of the approaches had any effect on the incidence of post-traumatic stress disorder; furthermore, more than three-quarters of the youth dropped out of the included studies as they progressed, making it impossible to draw conclusions about the durability of the results over time (Watters and O'Callaghan 2016).

A larger percentage of youth in low- and middle-income countries may experience stressors or low-grade traumas, and, as such, they could be considered at-risk rather than traumatized. Another review focused on how life skills training can improve mental health, predominantly among this group of at-risk youth. In their examination of 50 randomized control trials, Singla et al. (2020) found that interventions focused on parent-child interactions, management of interpersonal relations, and stress management significantly reduced anger, post-traumatic stress disorder, depression, and anxiety and increased life skills and functioning in daily activities. They concluded that comprehensive life skills programs can significantly improve mental health and other health outcomes for adolescents in low-resource settings.

Adolescent girls are significantly more prone to depression and anxiety disorders than their male peers. Few studies have examined these issues for youth in lower- and middle-income countries, but the evidence from those studies seems to indicate that cognitive behavioral therapy (CBT), interpersonal therapy, and, in the most severe cases, pharmacotherapy are the preferred approaches (Klasen and Crombag 2013). Another review similarly found a wide range of interventions—a variety of CBT, interpersonal therapy, creative play, didactic therapy, and bibliotherapy—potentially had good outcomes, but with significant variation on the outcomes for youth in each of the studies. The authors concluded that while these approaches held some promise, they must be tailored to individual needs to be effective (Uppendahl, et al. 2020).

Another important population to consider is youth with disabilities and youth with developmental disorders, as they may be less able or have fewer opportunities to engage their peers and, thus, be more prone to isolation. One review included a number of studies with this population, and the most prevalent choice of therapies was individualized training on activities of daily living resulting in increased independence, mobility, and, in some cases, acceptance within the community (Klasen and Crombag 2013). However, the evidence for this population is less robust than it is for some of the other subgroups of youth discussed above.

Lessons on Durability, Scale, and Sustainability

As noted above, adolescence is a time when durable choices are made. Each phase of psychosocial development provides scaffolding for the next stage, heightening the importance of good choices in adolescence. One of the most significant challenges is fostering healthy psychosocial development at scale. In this effort, promoting stability over a long period of time in familial and social settings that value children and youth is critical.

Trauma or stressors in adolescence compromise the ability of youth to function, and youth who have experienced trauma or stressors may need interventions to achieve long-term recovery and resilience. As noted above, a wide range of interventions have been used to address the mental health conditions experienced by youth. A recent review of evidence showed that the only effective approaches in this regard were CBT in individual or group settings with or without parental involvement. Specific approaches included "(a) psychoeducation about trauma prevalence, impact, and the intervention; (b) training in emotion-regulation strategies (e.g., relaxation, identification of emotion, cognitive coping); (c) imaginal exposure; (d) in vivo exposure; (e) cognitive processing; and/or (f) problem-solving" (Dorsey, et al. 2016, 318). For highly traumatized youth, these approaches are likely the most appropriate for improving their mental health and cognitive functioning. To be effective, these approaches require a highly trained workforce. While they can be delivered in community or school-based settings, they are not easily delivered at scale.

CBT may be beyond the resources of many youth, their communities, and the institutions that serve them. A more feasible intervention in lower-resource settings may therefore be trauma-informed care, which, in institutional settings, is based on three pillars: safety, connections, and management of emotions (Bath 2008). Schools are often the frontline institution with which adolescents interact, and recent scholarship has identified several key protective and promotive factors that should be fostered in the classroom, including problem-solving, stress management, school connectedness, and connection with other support systems (Pickens and Tschopp 2017). Trauma-informed care accordingly requires training but can leverage the skills of mental health paraprofessionals and professionals with training in other aspects of human development.

A final significant critique of the psychosocial schools of thought is that they underestimate the importance of culture in children's and adolescents' development. As noted earlier, some scholars have found resilience factors to be socioculturally bounded. The next section addresses this gap.

Summary of Key Points

- Adolescence is a critical period of psychosocial development in which youth develop their identities and shift their reference group from family to peers.
- Instability on any number of fronts (from parental behavior to political stability) in this period can cause delays in development or mental health issues, such as post-traumatic stress symptoms, depressive symptoms, anxiety symptoms, and externalizing behavior problems.
- Individual and group interventions can be effective in addressing mental health issues but are difficult to deliver at scale. As such, a more feasible option may be the use of trauma-informed approaches in public settings where youth engage with others in their communities.

Sociocultural and Socioecological Approaches

In sociocultural and socioecological approaches, the *interaction* of children and youth with others and their environments is critical for developing adult knowledge, beliefs, and habits, thus differing from the psychosocial approaches that focus on internal processes.

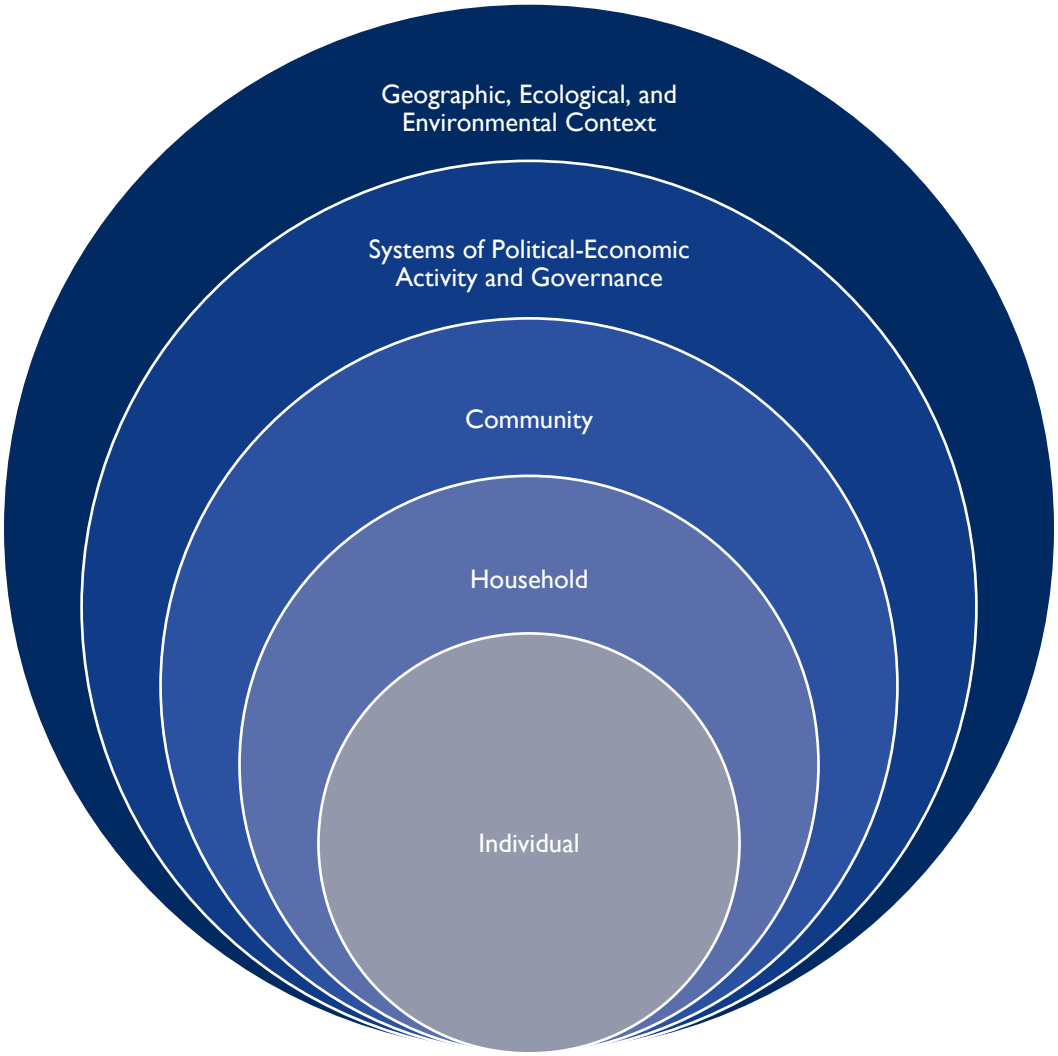
Key Lessons on How Youth Become Healthy, Engaged, Productive Adults

Vygotsky's (1978) sociocultural theory of learning states that learning is a social process in which learners interact with their environment and others who are more knowledgeable to gradually internalize concepts and skills. Both informal practical learning and formal academic learning occur in social groups and are not individual enterprises. Culture, ideological traditions, and environment, therefore, play a large role in shaping how youth conceive of their identities, opportunities, and roles in society because part of the learning process is mastering inherent assumptions about interpersonal relations and cultural hierarchical norms, which influence how youth behave within families and communities and in relation to various institutions in a society. As such, applying a sociocultural lens to youth development requires investigating the parameters of behavior permitted by cultural norms and the environment. Where laws, regulations, policies, or donor activities act in opposition to or require youth to behave outside those accepted norms, the results may be highly disappointing. Sociocultural theory is similarly applicable at a smaller scale: norms within the family or household can increase or inhibit the socialization of youth.

Similar to Vygotsky's theory, Albert Bandura's (1986) social-cognitive theory posits that environment is the chief driver of behavior and emphasizes the importance of observational learning, as well as the mental processing that occurs between an environmental stimulus and the individual's response (which the individual can choose among responses). Social-cognitive theory also emphasizes the importance of motivation in generating a response to a stimulus. Changes in the adolescent brain resulting in behavior changes discussed earlier (i.e., risk-taking, sensation seeking, and sensitivity to reward) also reflect a change in what motivates youth. These changes represent an opportunity to socialize adolescents into becoming functioning adults in society.

Another critically important lens that informs youth engagement is the socioecological model. This framework is based on the ecological-systems theory (Bronfenbrenner 1979) commonly used in behavioral health and some education studies (Roxa and Martensson 2013) to understand the sources of influence on behaviors and mitigating or aggravating factors. The model has multiple layers, as shown in Figure 1, and, in some ways, encompasses each of the other lenses discussed in this review.

Figure 1. Bronfenbrenner's Socioecological Model Applied to Youth Development



In working through each layer—the individual, household, and community, as well as the larger political and sociocultural context in which youths live their lives—the model enables researchers to correctly identify the barriers or obstacles youth face and develop corresponding programmatic or policy responses, or conversely, to identify the sources of support that assist youth and strengthen them. This model serves as the conceptual framework for the PYD approach that USAID has adopted as the basis for its youth programming. However, it is important to note that **from both the ecological systems theory and development systems theory perspectives, the layers of the socioecological model neither exist nor operate in isolation; they are, in fact, integrated and operate in relation to one another** (Silbereisen and Lerner 2007).

PYD represented a significant shift in approaches to youth development. Before PYD, most approaches to youth development were based on a deficit or risk model rather than focusing on youths' strengths. **PYD is based on fostering what is commonly referred to as the five Cs: competence, confidence, connection, character, and caring—all of which result in the sixth C: contribution.** PYD builds on the sociocultural tradition in that it focuses on the critical nature of the context in which youth mature (the community) and on the psychosocial tradition in its focus on how youth are agents of their own development. Furthermore, it goes beyond that to focus on an integrated, holistic approach to adolescent development, as described below.

> *The regulation of [adolescent] development occurs through mutually influential connections among all levels of the developmental system, ranging from genes and cell physiology through individual mental and behavioral functioning to society, culture, the designed and natural ecology, and ultimately, history* (Silbereisen and Lerner 2007, 5).

Lessons on Durability, Scale, and Sustainability

The socioecological model offers one key lesson for durability and sustainability in terms of the timing of change. Several scholars champion the idea of leveraging naturally occurring changes in a youth's environment to introduce PYD activities (e.g., transitions within the education system from primary to lower secondary, lower secondary to upper secondary, and secondary to tertiary). Another opportunity in some cultures is the phase where youth shift from their parents to their peers for reference setting. Significant changes in sociopolitical systems may offer another entry point for effective PYD interventions. Introducing change at key junctures when change is expected is easier than introducing change when continuity is expected (Silbereisen and Lerner 2007).

The socioecological model inherently focuses on scale as well as durability and sustainability. Indeed, individual change does not lead to adaptation in the socioecological model; only cohort change or change within a critical mass of individuals does (Silbereisen and Lerner 2007). Community-level change or normative change can become self-replicating, engendering a virtuous cycle of improvement within a community. PYD approaches create opportunities that other types of interventions (e.g., those focused solely on asset development) do not. According to some scholars, the role of community-level interventions is particularly critical; moreover, these interventions can be highly cost-effective because they support all or almost all youth (Benson, et al. 2006). Community interactions (at multiple levels) create opportunities to explore identities and pathways to build self-efficacy, as well as to generate social networks that may extend beyond what youth could access with their own resources. In addition, they also play a critical role as youth develop a prosocial orientation—encompassing the connection, character, and caring aspects of PYD mentioned above—and forming supportive relationships that fulfill their emotional, intellectual, and affiliative needs with adults outside their families (Silbereisen and Lerner 2007).

While PYD provides an integrated conceptual framework through which to develop programmatic interventions, it is important to note that **development systems theorists have identified some of the key behaviors required for PYD to be culturally situated.** As Silbereisen and Lerner remark about some low- and middle-income countries, "These countries are characterized by a mismatch between the prevalent practices of socialization and what is actually required in order to promote agency and initiative" (2007, 23). While agency and initiative may be inculcated to a greater degree in some youth than in others, social-cognitive theory's focus on motivation provides a pathway forward even in cultural settings characterized by low youth agency and initiative. In such cases, **it is important to understand youths' motivations for change (aspirations) and what they expect as outcomes. Responding to those motivations and supporting youth in achieving their aspirations can help foster positive characteristics effectively** (Hazel 2016).

A final critical element of working through a PYD lens, therefore, is identifying (1) the expected capacity for change and (2) motivations for change at the individual and contextual levels. A robust theory of change should then clearly articulate how change in a dynamic, interconnected system is expected to occur and what supports are needed to achieve the intended goals. It also requires change-sensitive indicators and multidisciplinary approaches to capture and measure those changes (Silbereisen and Lerner 2007).

Summary of Key Points

- Youth are shaped by social processes in which they interact with their environments (at multiple levels) to gradually internalize knowledge, skills, and norms. The ideal support system is one in which the household, community, political-economic, and geographical/ecological/environmental levels reinforce each other in support of an individual's aspirations and goals.
- Achieving change requires cohort change, and change is easier when introduced at natural or expected transitions in life.
- Understanding youth aspirations and expectations is critical to developing effective interventions that align with their motivations. In addition, it is necessary to understand the capacity for change—that is, the pace at and extent to which change is possible in a given context.

Behavioral Economics

Economics offers another approach to human development and behavior that is useful when considering adolescent development. Economics intersects with studies of human behavior particularly around the rationality of choices, risk preferences, time preferences, social welfare preferences, cooperation, and competitiveness (Sutter, Zoller, and Glätzle-Rützler 2019). A recent meta-analysis of 15 years of economic experiments with children, adolescents, and adults showed a distinct pattern across countries (although the study included only a few low- or middle-income countries): Children's choices were self-centered, which corresponds with their cognitive abilities as explained by theorists in the psychosocial tradition, while adolescents across countries sought more egalitarian and efficiency-oriented behavior. This shift between childhood and adolescence corresponds with the capacity for abstraction, and it represents an important window of time in which youth may be the most fervent advocates for social change in their communities. This interest, however, shifts again as youth age, and older adults favor members of their social group over others. Clear differences also emerged among children by socioeconomic status and by sex. Children from lower socioeconomic quintiles exhibited fewer prosocial behaviors and were less competitive than children from higher socioeconomic quintiles. In addition, boys focused more on efficiency and were more selfish than girls, while girls were more cooperative and egalitarian than boys (Sutter, Zoller, and Glätzle-Rützler 2019).

As noted, only a few low- or middle-income countries were included in the studies reviewed, including Armenia, Brazil, China, Colombia, India, Peru, Turkey, and Uganda. Therefore, the evidence that the patterns discussed are representative of patterns in low- and middle-income countries is not robust, but it does serve as a useful starting point. Additional research in this area would be useful, particularly in low-income countries, as very few were represented. Other areas of economics, however, have been studied extensively for impacts on youth development, particularly labor economics, which is the topic of the next section.

Summary of Key Points

- Adolescents typically engage in egalitarian and efficiency-oriented behavior and may be fervent advocates for social change in their communities, with young women being oriented toward egalitarianism and young men toward efficiency.

Labor Economics

Economics offers another level of explanation beyond the individual as well – rational behavior in the pursuit of livelihoods. In much of the developing world, the potential to reduce poverty through the agriculture sector is immense yet unfulfilled due to low productivity across farm and non-farm sectors. For example, although SSA countries achieved large increases in economic growth in the past three decades, this growth has failed to create the levels of employment needed to absorb the 14 million youth entering the workforce each year; moreover, this economic growth has not had a significant impact on poverty reduction or income inequality (Shimeles, Verdier-Chouchane, and Boly 2018). SSA's

agriculture sector, which is the source of employment for more than 50 percent of the region's population, continues to be dominated by low-productivity, subsistence farming.

Labor Market Trends

The economies and labor markets in SSA, as well as in other low-income countries, are currently going through a structural economic transformation. A slow increase in agricultural productivity is driving a shift in labor and production out of farming and into off-farm and non-farm sectors. Significant evidence, outlined below, highlights key trends which build on the following conclusions:

- The full-time equivalent (FTE)[16] share for agriculture has fallen in SSA for over two decades, ranging from 35 percent (Ghana) and 54 percent (Rwanda). This trend has a number of implications, principally that structural transformation is occurring as laborers shift out of agriculture. It also reflects the seasonality of farming and the fact that most agricultural workers increasingly have multiple livelihoods and income streams (Jayne, Yeboah and Henry 2018).
- Despite this decline in its share of labor, the agriculture sector absorbs more youth into its workforce than any other sector. Off-farm sectors of the agri-food system are growing at a faster rate than on-farm employment. Non-farm employment is the second-largest sector, though off-farm sectors of the agri-food system continue to rapidly increase (Jayne, Yeboah and Henry 2018).
- The average age in the agriculture labor pool is not rapidly increasing but remains steady in most countries; in some SSA countries, the average age is even dropping. This trend dispels concerns that the agriculture labor pool is aging, thereby threatening productivity. The age range of the average agriculture-sector laborer in SSA has hovered between 34 and 39 years old for the last decade. The age of rural laborers engaged in non-farms activity is one to three years younger (Jayne, Yeboah and Henry 2018).
- Increased agricultural productivity driven by the intensification of the agri-food production system is requisite for structural transformation of rural economies, the process of long-term changes in a system of production and distribution of goods, services, and employment. Evidence shows that intensification of the agri-food system results in a labor productivity gap between the agricultural and nonagricultural sectors. This gap in sector productivity, in turn, catalyzes changes in the demand for labor, moving workers from the less-productive agriculture sector to more productive, non-agriculture sectors. Evidence on the process and impact of structural transformation indicates that this labor productivity gap reduces both urban and rural poverty over time, as well as national-level inequality (Jayne, Yeboah, and Henry 2018; Fox 2019). Similarly, increases in agricultural productivity are positively associated with the release of workers towards manufacturing and services, confirming its importance for structural transformation (Dorinet, Jouvet, and Wolfersberger 2021).
- Education, particularly in technical, cognitive, and socioemotional skills, is critical to increasing labor productivity and labor supply. Gaps in access to high-quality education by sex and location (rural/urban) in some countries continue to hinder labor productivity gains (Acosta and Muller 2018).

Unfortunately, although agricultural productivity has increased in many low-income countries over the past 30 years, this growth has been driven by increases in the total amount of land cultivated and has been accompanied by limited intensification of the agri-food production system. "In rural areas, employment transformation (to steady, more productive wage employment) takes longer than in urban

[16] FTE presents a more realistic picture of labor allocation because it accounts for an individual's multiple income streams and the economic diversification and multiple jobs held by low-skilled, low-paid workers in low-income countries.

areas" (Fox 2019, 1). The impact of productivity driven by increases in land farmed is negative: agricultural wages and employment fall, poverty and income equality increase, and environmental degradation accelerates. As a result, many low-income countries remain in a state of low labor productivity, particularly in the agri-food sector. The underperformance has had a destructive multiplier effect: imports of agricultural products have increased while exports have fallen, environmental damage has been accelerated, uptake of climate change adaptations has been limited, and market systems have become less inclusive and efficient (Diao, Kweka and McMillan 2018; Amuri 2015; Shimeles, Verdier-Chouchane, and Boly 2018).

Key Lessons on How Youth Become Healthy, Engaged, Productive Adults

The productive engagement of youth and women in on-farm, non-farm, and off-farm roles in the agri-food system is essential to increasing productivity and reducing poverty. Analysis of panel data from 54 African countries between 2010 and 2017 provides evidence that underscores the importance of youth employment in driving rural transformation. It also suggests that **youth employment interventions that combine supply and demand approaches are important to rural transformation, as increases in agricultural sector employment, given the availability of employment in other sectors, leads to declines in the youth unemployment rate in Africa** (Ude 2020).

Other key findings include:

- The ratio of youth employment (rural and urban) to population positively influences economic transformation in African countries. Conversely, rural unemployment drains productivity and negatively impacts rural structural transformation (Ude 2020).
- The rate of youth literacy is inverse to the rate of youth unemployment (Ude 2020).

Women are essential to agriculture, accounting for 40 percent of the agriculture workforce globally. In SSA, for example, women account for the greatest shares of the agriculture workforce along the rural value chain. They comprise 80 percent of food producers and 60 to 90 percent of the rural market linkages (Ola 2020). Though they dominate the agriculture sector, women face greater challenges than their male counterparts in terms of restricted land tenure, limited access to assets (e.g., finance, land, productive capital), and limited technical knowledge, skills, and information about improved techniques. Women also face gender bias in employment and market access due to social norms, gender discrimination, and the prevalence of sexual harassment. Furthermore, legal and cultural norms related to land rights, property ownership, inheritance, and education often discriminate against women. In addition, the household and caretaking responsibilities are further limitations on female participation and remuneration (IFC 2016). Evidence suggests that in the absence of these constraints, women workers could be as productive as their male counterparts across sectors, including agriculture (Shimeles, Verdier-Chouchane, and Boly 2018).

Unfortunately, the participation of youth and women in the agriculture sector is often as voluntary unpaid workers on household farms, which is partly due to familial demands but also primarily because youth and women encounter greater constraints to independently pursuing farm and non-farm activities. Indeed, for many youth, that is the pathway into the agricultural workforce—as unpaid workers on family farms (Ude 2020). Many begin to work as children, with child labor in agriculture exceeding that of all other sectors and accounting for 59 percent of all children in hazardous work (ILO 2021).

The paucity of employment opportunities in rural areas is the main driver of increased youth migration out of agriculture and rural areas. Evidence indicates that low wages, barriers to land access, and limited agricultural opportunities push low-skilled youth to migrate from rural to urban settings and out of agriculture to non-agriculture sectors. Similarly, prospects for better wage employment opportunities and declining interest in traditional farming methods lead more educated youth to migrate. Importantly, urban migration has resulted in an increase in rural agricultural wages due to labor scarcity (Ude 2020).

Lessons on Durability, Scale, and Sustainability

Agricultural productivity drives economic structural transformation through multiple pathways to poverty reduction, and each pathway carries programmatic implications that will be discussed in the following section.

- *Labor markets transformation:* Increases in agricultural productivity reduce the demand for labor, particularly in subsistence and household production, shifting surplus labor to activities with higher productivity. Thus, labor is pulled into non-agricultural activities or more productive agriculture subsections or value chain roles. At a household level, livelihood streams can become more diversified as labor is freed (Jayne, Yeboah and, Henry 2018).
- *Increased production:* Poor households gain economically from increased sales and higher margins directly as consumers or through income generated from diversification to non-farm activities (Jayne, Yeboah, and Henry 2018)
- *Increased consumption:* Increased and diversified agricultural production can drive down the prices of food and agricultural inputs, thereby improving food security and nutrition while increasing the amount of disposable income available for savings and investments in assets. Furthermore, poor populations accrue the greatest benefits because they spend the largest portion of their income on food (Jayne, Yeboah, and Henry 2018).
- *Increased wages:* As agricultural productivity increases, agricultural laborers earn more through increased and sometimes better employment opportunities accompanied by higher wages. This pathway is essential in the context of countries such as Asia where high population density is accompanied by well-developed agricultural wages (Jayne, Yeboah, and Henry 2018).
- *Technological advances and innovation:* As innovations are adopted at scale, increased agricultural productivity results in poverty reduction. Evidence suggests that the continued reliance on rain-fed irrigation and slow adoption of lower-cost irrigation options is a significant reason for low agricultural productivity, stagnant farm and non-farm employment, high food prices, and limited poverty reduction (Moyo, Bah, and Verdier-Chouchane 2015).

Evidence is limited and mixed on how to increase the supply of decent employment opportunities for youth in rural economies where economic structural barriers in both supply and demand limit employment creation. On the demand side, low productivity, shallow markets, and weak infrastructure limit job creation and drive unemployment. On the supply side, the barriers that youth face are intensified by geographic isolation, weak educational and health systems, and limited market linkages and social capital. Employment creation has lagged, thereby resulting in a "missing jobs" phenomenon (Fox 2019).

The dearth of job opportunities is most acute for entry-level job vacancies in manufacturing, retail, and services. Youth with low levels of education attainment face stiff competition for these limited spots. On the other hand, highly skilled jobs requiring post-secondary education (e.g., trained engineers, ICT, and health workers, among others) are severely labor-constrained. Youth with ICT skills are also in demand in developing country labor markets (Fox 2019).

Summary of Key Points

- Youth remain a significant proportion of the agricultural workforce in many low- and middle-income countries, and millions seek to enter the labor market annually and face a "missing jobs" crisis. Lack of employment in rural areas is the main driver of increased youth migration out of agriculture and rural areas.
- Increased agricultural productivity driven by the intensification of the agri-food production system is required for the structural transformation of rural economies, the process of long-

term changes in a system of production and distribution of goods, services, and employment. Rural unemployment drains productivity and negatively impacts rural structural transformation.

- Increases in agricultural productivity reduce the demand for labor, particularly in subsistence and household production, and strengthen earnings while shifting surplus labor to activities with higher productivity. At the same time, increased production can lead to lower prices and greater consumption.
- Adoption of innovation at scale also increases agricultural productivity and rural poverty reduction. Youth and women face greater constraints to accessing and adopting innovation and to independently pursuing farm and non-farm activities.

Policy Systems/Rules Approach

A positive enabling environment is key to supporting poverty reduction and resilience with systems that increase the human, social and economic capital of an empowered and engaged youth population. Regulatory, legal, and policy regimes can drive or hinder productivity, market systems development, and environmental protection across all sectors of the economy.

Over the past 15 years, African governments that have effectively promoted farm productivity growth (Ethiopia, Rwanda) have enjoyed faster poverty reduction, higher labor productivity in non-farm segments of the economy, and a more rapid diversification of the labor force from farming into the broader economy. Since most African workers remain engaged in agricultural work, agriculture will continue to influence employment and livelihood opportunities both in agri-food systems and broader non-farm sectors. A comprehensive agricultural growth strategy that promotes competitive and efficient production and marketing systems may therefore be the foundation of an effective employment expansion strategy for most African governments. (Jayne, Yeboah, and Henry 2018, 6).

While many national governments have set agriculture-led poverty reduction and youth employment as important goals, most low-income country governments lack the information, knowledge, and resources to successfully identify and address the key systems-level constraints to strengthening food systems and fostering youth development.

Key Lessons about the Enabling Environment for Rural Youth Employment

Mueller and Thurlow (2019) reviewed 47 policies from 13 SSA countries, finding that policy regimes focus too much on supply-side factors that impact the relevance, quality, and size of the labor pool. Such policies address constraints related to youths' access to productive assets, education levels, and the social norms that influence the employability of youth, particularly young women. As a result, public investment is directed toward labor-supply strategies such as programs to build the technical, socioemotional, and entrepreneurial skills of youth. However, limited focus has been directed to labor demand-side constraints that drive economic growth, including regulatory constraints on businesses and employment creation, particularly agribusiness, investment, market access, and youth engagement in policy (Mueller and Thurlow 2019).

Robust evidence on effective system-level strategies to create enabling environments for youth development, especially in rural areas, is limited. However, the literature highlighted several focal areas discussed below.

Education system: Evidence suggests that while an educated population is important to poverty reduction, it is insufficient and not necessarily to be prioritized over other systems-level investments such as infrastructure and market development (Mueller and Thurlow 2019). Furthermore, there is limited consensus on the needed amount of schooling (i.e., years), type of schooling (i.e., in-school, out-of-school, peer-to-peer), and the priority capabilities (i.e., technical, cognitive socioemotional skills). It is generally agreed that basic education, literacy, and numeracy are essential and need wider success in low-income countries (Fox 2019; Mueller and Thurlow 2019).

Secondary education is also important, and though evidence on priority skills is limited, research increasingly shows the importance of socioemotional skills (i.e., intra- and interpersonal skills, work readiness), as well as the other benefits of schooling (e.g., strengthened networks and social capital), lead to better employment opportunities. Unfortunately, most low-income countries fail to provide quality and accessible secondary education, and less than a third of youth in low-income countries enroll in upper secondary education (UNESCO Institute for Statistics 2021). The situation is even direr for rural youth who acquire fewer years and lower-quality education than youth in urban areas (though encouragingly, they generally achieve higher education levels than their parents). However, the limited evidence available indicates youth are not acquiring through the education system the socioemotional skills demanded by employers. As a result, while they may be more competitive than older workers in a rural setting, they are limited in their opportunities to acquire wage employment or play a catalytic role in agricultural transformation (Fox 2019).

Transition of rural youth into wage or self-employment: While driven largely by structural issues such as economic growth, geography, and aggregate labor demand, policies that can positively impact youth employment include ecosystems strengthening for youth agripreneurship, market-driven education and skills-building support, rural access to social protection, workers' rights, age anti-discrimination regulation, and support for youth engagement in agricultural producers' organizations to involve them in collective bargaining.

Channels for youth participation in decision-making: Channels for youth participation help youth build leadership skills and ensure their needs are incorporated into system-level policies, regulations, and norms. Youth can participate in decision-making through business associations, agricultural cooperatives, or youth associations, as well as by engaging with local, regional, and national policy processes such as participatory budgeting, and social accountability mechanisms, etc. (Mueller and Thurlow 2019).

Social-protection programs aligned closely with rural development policies: Governments need effective national development policies that leverage social protection alongside rural and agriculture development to break the cycle of poverty and exclusion. Social protection plays a key role in ensuring income security for women and men of working age, in the form of maternity protection, unemployment support, employment injury protection, and disability benefits. These schemes help to smooth incomes and aggregate demand, enhance human capital, and promote decent and productive employment. Social protection also facilitates structural change within economies and labor markets and contributes to inclusive and sustainable growth (International Labor Organization 2017).

Social protection has virtuous impacts on local communities and economies. Public works programmes can provide important infrastructure and community assets and, when designed and implemented properly, contribute directly to the local economy. Cash transfers increase the purchasing power of beneficiary households, who demand goods and services, many of which are produced or provided in the local economy by non-beneficiary households. Complementary programmes may be necessary to reduce production constraints to prevent inflation and maximize the real-income and production impacts of the programme (Food and Agriculture Organization of the United Nations 2015, xvii).

Key Lessons on the Enabling Environment for Agricultural Sector Productivity and Market Access

Systems-level interventions should promote policies in line with best practices for inclusive, sustainable and competitive market systems development to increase agricultural productivity, as well as economic inclusion and equality. Many of the constraints that impact youth employment hamper agriculture and rural productivity at large. According to Modi (2019), the low level and inefficiency of public investment in the agricultural sector is the principal reason for low productivity in SSA. Similarly, the results of Goyal and Nash's (2017) research suggest that increased public investment in agriculture systems can increase agricultural productivity and improve the incomes of low-skilled farmers, thereby hastening structural transformation. The important caveat is that public funding must target the most effective and efficient investments that can drive increased agricultural productivity. Not only were inefficient and low-quality investments useless in reducing poverty and inequality, but in some cases, investments were also regressive and supportive of non-poor populations at an opportunity cost borne by the rural poor (Jayne, Yeboah, and Henry 2018). The literature review identified priority agriculture sector investments, as well as ineffective or inefficient investments to be avoided (Modi 2019; Goyal and Nash 2017).

Policies in support of rural market development: Pro-poor changes in policy can lead to productivity increases and poverty reduction. Key areas of focus include access to land through improved land tenure systems or leasing products; trade policy and enforcement; inclusive financial regulations; support for research and development, especially efforts to "crowd-in" private investment; support to the collective action of small producers and MSMEs; improved human capital through support to market-aligned technical and vocational education and training (TVET) services and other skills-building services; policies to support positive spillovers between agriculture subsectors and non-agriculture sectors (Leao, Ahmed, and Kar 2018); support for positive spillovers and externalities created by large market actors; private sector engagement and coordination; and diversification toward high-value crops and livestock (Jayne, Yeboah, and Henry 2018; Liao, Barratt, and Kassam 2014; Adam, Bevan and Gollin 2018).

The evidence on public spending on agriculture sector subsidies varies, depending on the type of subsidy, but generally suggests that input subsidies are not the most effective public investment. Although input subsidies increase input usage and result in greater yields and increased income at the farm level, the poverty reduction impact is unclear. Furthermore, the potential impact is diminished by the high incidence of inefficient management, corruption, and biased distribution. The evidence on subsidies to support increased supply or demand for irrigation, insurance, and climate-smart technology is inconclusive but highlights the importance of understanding market dynamics and projecting and responding to risks created by unintentional consequences (Goyal and Nash 2017).

Agricultural infrastructure improvements: Public investment in infrastructure should seek to reduce market constraints, especially those that impact rural and excluded populations such as youth. While early research (Calderón and Servén 2004) indicated that growth is positively affected by increased

infrastructure stock and that poverty and income inequality decline with increasing infrastructure quantity and quality,ore recent evidence suggests that targeting is important. Infrastructure investments targeting rural and poor areas have the greatest return.

The impact of electrification depends greatly on specific contextual issues but has a moderately positive impact on socioeconomic welfare with the strongest positive outcome being increased study time, especially at night (Moore, et al. 2020). Further evidence suggests that mobile phone and internet connectivity is a priority and has great potential to increase agricultural and non-agricultural productivity. Although it is commonly believed that mobile and internet penetration is strong in low-income countries, more than 800 million people in SSA, particularly in rural areas, lack access to these and other potential productivity-, sustainability-, and inclusion-driving technologies (Bahia and Delaport 2020).

The impact of road and transportation investment depends on pro-poor targeting in terms of geography and population. The distributional impact of transportation improvements depends on household characteristics and welfare rather than location (rural-urban) or sector. In some scenarios, transport investment negatively impacts unskilled workers for whom changes in the terms of trade outweigh the direct benefits of improved transport (Adam, Bevan, and Gollin 2018).

In addition, investment in affordable and accessible irrigation systems—through investment in R&D, construction of hard infrastructure, and smart subsidies to stimulate supply and demand—can have a large impact on productivity where rain-fed irrigation is prevalent (Adam, Bevan, and Gollin 2018; Larson, Muraoka, and Otsuka 2020).

R&D: System-level collaboration and action among government, higher education, and the private sector are important to develop, promote uptake of, scale, and sustain appropriate productivity-enhancing and climate-smart technologies for irrigation, improved inputs (e.g., fertilizers, improved seed varieties, integrated pest control, increased access to land, finance, etc.), infrastructure, products, and services.

Riesgo, Louhichi, and Gomez y Paloma (2020) indicate that R&D in the agriculture sector has a high rate of return globally (45 percent), with SSA achieving a lower, yet impactful, rate of 35 percent. Despite the potential, agricultural R&D remains underfunded in most lower-income countries, falling well below the recommended rule of thumb that R&D investment be no less than one percent of agriculture's contribution to GDP. In SSA, investment was estimated at 0.4 percent in 2017 (Goyal and Nash 2017) and has since fallen.

With the possible exception of mechanization, technologies that improve overall small-farm productivity usually help farmers achieve higher yields. With yield gaps in SSA generally high, even a partial narrowing could have a significant impact on local and global food supplies. A careful and transparent approach to promoting new commercial farms carved out from underutilized land resources can help improve food supplies over time, but likely with fewer benefits for economic growth or poverty reduction and with greater stress on Africa's natural resources and ecologies (Riesgo, Louhichi and Gomez y Paloma 2020).

At the same time, agricultural productivity has benefited significantly from investment in several areas of R&D: climate-smart technologies, connectivity, land tenure policy, irrigation, improved inputs, post-harvesting handling, and agro-processing (Adam, Bevan, and Gollin, 2018; Riesgo, Louhichi, and Gomez y Paloma, 2020). Technology is not a silver bullet, even in the case of youth who are generally considered to be more educated and tech-savvy than previous generations. The introduction of unproven technologies can be a financial risk to low-skilled, poor populations. Technologies that remain exclusive and unavailable to smallholder farmers, MSMEs, and marginalized populations, such as youth and women, can have a negative economic impact as they increase the competitive advantage of larger, resource-rich large market actors (Dorosh and Thurlow 2018).

Lessons on Durability, Scale, and Sustainability

Government-driven social protection plans: Increasingly, evidence indicates cash-plus or economic inclusion programs can be cost-effective if they are implemented through governments in close coordination with other international, national, and local development actors. On the other hand, standalone programs implemented by a single donor or partner are expensive and unlikely to achieve a sustainable scale. Governments have the convening power to buttress public investments in coordination with donors, the private sector, and civil society may hold more promise in sustainability and scalability (Paul, Dutta and Chaudhary 2021).

Investment in R&D infrastructure and systems: Governments and other market actors need to invest in a country's innovation system for identifying, developing, disseminating, and scaling research, information, and technologies. Investments in building a country's human capital and the capacity of its private sector, government, educational institutions, and civil-society actors to produce data, build an evidence base, design and innovate, disseminate information, and manufacture innovations are key to sustained innovation-driven productivity increases.

Collaboration and collective action: Collaboration is essential for effective and sustained impact, but the evidence is limited and context-specific on best practice models for collective action and private sector engagement (PSE). PSE strategies are effective in building market resiliency and inclusivity through support for market-driven skills building, enterprise models for producing and delivering affordable products and services to underserved populations, and business models that generate employment and entrepreneurship opportunities for youth, women, and other vulnerable populations. At the national level, capacity strengthening approaches targeted the effectiveness and sustainability of social safety nets, early warning systems, natural resource management, and climate adaptation approaches (Goyal and Nash 2017).

Public financing: The source of public financing matters for poverty reduction impact, durability, scale, and sustainability since tax incidence, relative price, and real exchange rate movements will have distributional consequences on different workforce segments. For example, rural, unskilled labor forces may experience a reduction in real consumption wages if public expenditure is financed through a tariff, whereas urban skilled labor may be negatively impacted by a sales or consumption tax. Public investment financed through international concessionary grants can result in real exchange appreciation which typically benefits "the more traditional, domestic-oriented nonagricultural sector over the more productive, open modern sector" (Adam, Bevan, and Gollin 2018; Diao, Kweka, and McMillan 2018). Because unskilled workers dominate the former, donor-funded financing may result in greater poverty reduction, while less dependence may increase overall labor productivity in a trade-oriented, modern agriculture sector.

Summary of Key Points

- Significant public investment has been directed toward labor supply strategies such as programs to build the technical, socioemotional, and entrepreneurial skills of youth, but there has been much less complementary focus on demand-side constraints that drive economic growth, including regulatory constraints on businesses and employment creation, particularly agribusiness, investment, market access, and youth engagement in policy.
- Public investment in agriculture systems, including infrastructure and R&D, can increase agricultural productivity and improve the incomes of low-skilled farmers, thereby hastening structural transformation, but inefficient and low-quality investments can be regressive and further impoverish the rural poor.
- The source of public financing matters for poverty reduction impact, durability, scale, and sustainability. Tax incidence, relative price, and real exchange rate movements have distributional consequences on different workforce segments.

Discussion

These significant bodies of literature demonstrate the complexity of adolescent development and, to the extent that evidence exists for low-resource settings, the pathways most supportive to youth in their journeys toward adulthood. It is useful to examine how the evidence discussed above contributes to the GFSS's poverty reduction objectives and how it aligns with, complements, or is in tension with the processes by which youth become healthy, engaged, productive adults in their societies.

Inequality and Inequity

Central questions in addressing inequality among youth (and other populations) include how to define poverty reduction and how to measure inequality. The bodies of literature examined here highlight some of the inequities and sources of inequality in outcomes for youth (poor nutrition, experience of severe stressors and trauma, sociocultural norms (including gender norms), and an unsupportive enabling environment based on one or more individual attributes, such as gender), as well as approaches to ameliorate those disparities and improve equity. A key takeaway is the importance of not treating youth as a homogenous group. **While all youth may be at a disadvantage to adults in some ways, examining the root causes of inequality for youth in specific contexts is critical to engaging them effectively to achieve poverty reduction. Additional research would be particularly useful in this area to improve the evidence base on how factors associated with vulnerability affect poverty as measured by income and consumption—particularly over a long time period—as well as patterns of intrahousehold allocation to explain or predict the allocation of resources to children and youth.**

Inclusive and Sustainable Agriculture-Led Growth

The literature on inclusive and sustainable agriculture-led growth indicates that growth in the agriculture sector can be two to three times more effective at reducing poverty than the same amount of growth in other sectors, particularly in the poorest countries and those with the largest share of people working in agriculture. The impact of growth in agriculture weakens as GDP increases and as the workforce shifts from agriculture to more productive sectors. The dichotomy between agriculture-led and non-agriculture-led growth is also somewhat problematic in that agriculture depends on other sectors, including trade, transport, retail, and others. The interdependency of economic sectors means that growth in agriculture also depends on the health of trade, transport, retail, and other sectors. In addition, growth in the agriculture sector likewise supports growth in other sectors. The key factors supporting productivity improvements in agriculture, and indirectly on poverty reduction, are human capital and innovation.

Human capital improvements can be informed by the youth development lenses discussed above. Healthy physical and physiological development, based on good nutrition, healthful choices for physical activities, and the absence of extreme stressors or trauma, make the mind and body useful assets for youth as they enter adulthood. They concurrently experience psychosocial and cognitive development processes, including the formation of reciprocal one-to-one relationships and caring adult relationships, the completion of their primary and, or secondary education, and participation in the community through work and civic means. The processes by which youth form relationships are heavily influenced by sociocultural factors, and, from a developmental systems perspective, supportive relationships are a critical element of the enabling environment. The policy/systems lens highlights that educational attainment is important, though there is significant debate about the key skills that are needed beyond foundational literacy and numeracy; the answer likely depends on the context. How youth enter work and public life is also determined by sociocultural factors; behavioral economics, including risk, time, and social-welfare preferences; and labor economics, including the availability of opportunities in informal employment, wage employment, and entrepreneurship. The policy/systems lens also emphasizes the importance of participatory channels for youth to build leadership skills and engage in community affairs,

which is particularly important as scholars observed that in some contexts, the social processes for youth development inhibit the development of skills and behaviors needed as adults. All of these factors are important in understanding the human-capital outcomes and rational choices by actors within food systems.

Innovations generally come in the form of technologies that improve overall productivity through higher yields or reduced costs. Both the labor economics and policy/systems schools of thought contribute to discussions on strengthening innovation in the agriculture sector, citing infrastructure and R&D systems as critical areas for investment. As noted earlier, infrastructure investments targeting rural and poor areas have the greatest return. The key areas identified in the literature for investment or subsidization include mobile and internet connectivity, digitization of food-system processes, affordable and accessible irrigation systems, electrification, and, if targeted correctly, road and transportation infrastructure. Another aligned area of public, private, and donor investment is in R&D infrastructure that can develop, disseminate, and scale research, information, and technologies. While the literature makes clear that R&D infrastructure requires system-level collaboration and action among government, higher education, and the private sector, it is not clear what pre-conditions must exist to initiate collaboration where none exists. The literature also lacks detail on the specific types of mechanisms that work well to achieve collaboration under different governance and market development conditions.

The investments discussed above may not produce equitable outcomes, particularly where sociocultural practices benefit some groups over others. One approach—support to small market actors, including youth and women—showed a high return on poverty reduction investments. Such support can take the form of asset accumulation through training, extension, and access to finance and credit to increase productivity. In addition, it can take the form of increasing social capital by facilitating stronger connections to market actors, which is supported by the literature on inequality that showed women with access to community assets and decision-makers were less poor than those without access.

Resilience

The literature on resilience in low- and middle-income countries remains limited. At the individual level, most activities focus on asset accumulation, income diversification, and social protection. However, the various schools of thought discussed above do not necessarily align with this approach.

The literature on poverty reduction supports a focus on asset accumulation (i.e., various forms of assets can be converted into productive economic activity that supports the basic needs of a household). Nevertheless, one gap in the literature on resilience (as constructed for this review) is the lack of acknowledgment that living in poverty may introduce stressors as well as physiological reactions that inhibit cognitive and physical development, which form the basis of two key asset pools at the individual level: knowledge and skills.[17] In addition, conflict and violence, living without parental care, migration, or other life-changing events may further delay development. Debates within the psychosocial tradition demonstrate the weakness of assuming "normal" development trajectories when children and youth are faced with significant stressors or trauma. The types of stressors and trauma experienced vary, and although individual attributes do serve as protective factors, the attributes and how youth employ them to cope and recover depend on the context and sociocultural environment.

In addition, though some therapies are highly effective in addressing mental health needs, most such therapies require a highly skilled workforce to deliver. Moreover, these therapies are individualized or focused on small groups, making them difficult to scale. Where those conditions cannot be met, trauma-informed approaches may be used by paraprofessionals and others with some background in child development to create the safe spaces and connections youth need to begin functioning normally again.

[17] USAID's work on children in adversity does account for the stressors and impacts of living in poverty, but as of this writing, these two separate approaches to resilience were not fully integrated.

Some scholars from the psychosocial tradition point to the importance of a supportive socioecological context, indicating that it may be equally or more important than individual attributes. This point of view aligns with the PYD approach that highlights the importance of supportive relationships.

The second approach to resilience, economic diversification, is at the center of an unresolved debate about whether diversification or specialization is more effective in the long run. From an economics perspective, individuals and households generally maximize their opportunities within the bounds of their risk tolerance. However, although studies in the U.S. indicate that women and older people are more risk-averse than men and younger people generally (Yao, Sharpe, and Wang 2011; Fisher and Yao 2017), little scholarship has been conducted on risk tolerance among the poor in low- and middle-income countries, and it is unclear how sociocultural differences affect these patterns. Moreover, the lack of information about decision-making processes within households, including the extent to which youth have a voice or how their needs are taken into account, makes it difficult to predict how households of various compositions in a range of sociocultural settings would perceive and tolerate risk. In addition, given that brain development continues into the early-to-mid 20s, the decision-making and risk assessment skills of youth may not be fully developed until that time (or later if their cognitive development has been delayed). As a result, youth may not be in a strong position to make informed decisions about their risk tolerance until that time.

Finally, as noted earlier, graduation models, cash-plus programs, or broader economic-inclusion programs that use a bundled set of interventions have a larger impact on income, assets, and savings relative to standalone interventions, such as cash transfers. These programs intentionally focus on building assets, increasing connections, and creating access to jobs or entrepreneurship opportunities. Much of the recent research indicates that graduation models and comprehensive cash-plus models are too costly to take to scale. New evidence, however, is emerging that shows that a smaller range of carefully curated interventions can be effective in achieving resilience and food security. As new evidence becomes available regarding the complementarity of interventions that best achieve food security goals, these approaches should be taken up at scale as they align well with a PYD lens and should be effective in supporting youth.

Another layer of resilience activity occurs at the community level, addressing to some extent the socioecological context for individual resilience. Perhaps more so than individual-level resilience activities, community-level resilience approaches are highly dependent on context and risk. The extent to which and how youth are engaged varies, and evidence is context-specific and not readily generalizable (for example, the approaches needed for how to engage youth in conflict-affected areas might vary based on their various identities and characteristics that would place them at risk for that specific conflict; similarly, approaches to engage youth might differ in the flood-prone and arid zones depending on the hazards and resources within the community).

Nutrition

Adolescence is a time of high nutritional needs, and more than 40 percent of youth globally living on less than $2 per day signals a global adolescent nutrition crisis. This represents a lost opportunity for catch-up growth and risks entrenching intergenerational malnutrition through adolescent pregnancy. The current evidence base around adolescent physiological development supports expanding nutritional education and micronutrient supplementation/ food fortification, focusing on iodine, iron, zinc, and vitamin A for adolescents starting at pubertal onset to help individuals achieve full physical and cognitive development (although youth nutrition may still be secondary to activities focusing on the first thousand days). Nutrition education is also important as food preferences and habits are formed in adolescence. In addition, in communities and households where food insecurity is chronic, food aid may be appropriate. Broader incentives and policies may also help increase targeted food fortification, particularly in school feeding programs, for example, where youth populations can be well-targeted (where secondary school drop-out is low or a significant complementary effort to maintain enrollment

and attendance is in place), and interventions can avoid harming other segments of the population that might develop conditions related to the over-ingestion of micronutrients.

Investments in nutrition presently appear to be not only cost-effective but also durable, in that early interventions can have long-ranging results (although specific rates of return for adolescent nutrition interventions are not readily available). To reach a significant proportion of youth, such interventions must likely be administered at the community level, particularly if large proportions of youth are out of school or if an intervention is targeting older adolescents and young adults.

A related important priority in achieving nutrition-related goals is reforming food systems, particularly expanding rapid and cold-storage supply chains to increase the availability of varied, healthful fresh food and lessen reliance on heavily processed packaged food items. The factors discussed above on innovation and R&D, such as mechanization, infrastructure, and new technologies related to shortening time to market, will play a critical role in achieving large-scale change to supply chains.

It is important to note that current evidence indicates that nutrition alone is not sufficient to reduce poverty. While adolescent and young-adult nutrition interventions provide opportunities for catch-up growth and support improvements in cognitive development—thus contributing to youth asset accumulation—these interventions should be complemented by other activities, such as skills development and employment support, as suggested by all schools of thought discussed in this paper.

Conclusion

Engaging youth effectively in interventions designed to reduce poverty may require governments, donors, and youth-serving organizations to adjust how they engage with diverse youth.

- To achieve change at scale, societies need to adapt, and perhaps in some cases redefine, how youth engage in their broader communities. Engaging a critical mass of youth requires applying physiological development, psychosocial development, and socioecological and sociocultural approaches, as well as the lenses of labor and behavioral economics and policy/systems, as discussed in this paper—with the socioecological model/PYD approach providing an overarching conceptual framework.
- Poverty does not affect all men, women, youth, or children the same ways. Lack of information about intrahousehold allocation obscures how and how many children and youth experience poverty.
- The agriculture sector generates greater growth than other sectors as long as GDP is low and the percentage of the workforce in the agriculture sector is high. The primary drivers of increased labor productivity are human capital improvements and innovation.
- Human capital improvements through the PYD lens take into account physical and mental health, cognitive development, motivations and perceptions of self, and the enabling environment, particularly connections to others and activity in the public sphere.
- Investments in mobile and internet connectivity, digitization of food-system processes, affordable and accessible irrigation systems, electrification, road and transportation infrastructure, and R&D infrastructure have the most significant poverty-reducing effects for the rural poor at the household level.
- Marginalized, small market actors benefit from targeted support that can decrease inequality of access to resources and outcomes. Specifically, effective interventions are those that support the development of technical, cognitive, and socioemotional skills; capital accumulation, work experience, and social and economic networks; access to markets and transportation systems;

and access to appropriate and climate-smart technology related to irrigation, improved inputs, mechanization, and products and services.

- Resilience or the ability to mitigate, adapt to, and recover from shocks and stresses is a dynamic concept that operates at multiple levels (e.g., individual, family, peer, school, and community levels), and promotive and protective factors are often socioculturally and situationally dependent. As such, effective resilience programming must be tailored to both the shock or stress and the norms of the communities in which it operates. Where resources are limited, trauma-informed approaches may represent a best value way to engage vulnerable youth.
- Youth may not have the risk assessment skills to accurately weigh the risks and benefits of specializing vs. diversifying their economic activities (or other aspects of their choices). Any activities supporting youth in this process should help with the risk analysis.
- Social protection measures provide short-term relief to poverty, but only multipronged economic-inclusion activities resulted in longer-term poverty alleviation. Additional research should be conducted to further the evidence base on the complementarity of interventions that will be most effective and scalable.
- Nutrition interventions cannot guarantee poverty reduction among youth. However, nutrition achieves durable outcomes in the form of improved cognition and physical health that can contribute to youth asset accumulation and well-being, which serve as protective factors.
- The literature on youth physiological and cognitive development points to a range of interventions that could be employed to complement and enhance the benefits of USAID's current focus on the first thousand days of life, including nutrition education for adolescents and communities broadly; micronutrient supplementation or food fortification of iodine, iron, zinc, and vitamin A; and targeted macronutrient supplementation where appropriate.
- Measuring youth poverty and inequality will require additional research and development of models of resource allocation within households in order to develop appropriate interventions that will improve the equity within households and ensure that poverty alleviation benefits all household members.

Recommendations

USAID may wish to consider some adjustments to its strategies and activity design in light of the emerging body of evidence on youth development, with some ideas as follow:

- Defining poverty reduction (at least at the activity level) as reductions in the depth, severity, or incidence and determining appropriate measures for achievement of that goal, as well as measures for inequality as it relates to that goal.
- Refining USAID's application of the PYD model (using a development systems theory perspective) in four critical ways:
    - Ensure that the prosocial orientation of youth (connection, character, and caring) is stronger in interventions around assets, agency, contribution, and enabling environment. Models might include service learning, disaster risk reduction activities, and engagement in community problem-solving.
    - Focus more on intergenerational approaches with supportive relationships with adults (one-to-one and within public spaces) as a critical aspect of the enabling environment. Models might include mentorship, apprenticeship, or association membership subsidies/support.
    - Incorporate nutrition and physical well-being beyond reproductive health as part of a broader strategy to promote and support young people's overall well-being.

    - Engage more intentionally with the role of culture and cultural norms in the enabling (or disabling) environment to create pathways for youth, and particularly marginalized youth to access more opportunities. Models might include intergenerational dialogues, sector-specific consultations and dialogues, and peer to peer mentoring and support.

- Understanding youth trajectories and the sociocultural, political, economic, and physical barriers that inhibit youth from fully participating in REFS-related programming (e.g., experiences of violence for young men, young women, and youth who identify as non-binary and early marriage, early pregnancy, and unpaid care work for young women) using in-depth youth analyses, intersectional gender analyses, inclusive development analyses, political economy analyses, and multi-hazard risk analyses where appropriate. This understanding can then underpin activity designs targeted at specific life stages with appropriate supports.
- Gathering additional information in the activity design stage regarding the household allocation of resources, particularly for younger youth still living within a larger household, using in-depth youth analyses and community consultations focused on family decision-making, for example. This broader analysis will help ensure that choices around allocation and vulnerability to shocks and stressors are understood and considered within a variety of household contexts.
- Intentionally targeting specific segments of the youth population who are poor and most vulnerable to poverty, shocks, and stressors, taking into account their various identities (age, disability, ethnicity, gender, gender expression, gender identity, native or Indigenous origin, race, religion, sex, sexual orientation, socioeconomic status, and other factors, etc.) rather than using a single cross-cutting intermediate result or overarching goals that address youth more generally. This may require more intensive use of youth analyses and sector-specific analyses that consider youth at key points in the program cycle.
- In contexts where GDP is low and the percentage of the workforce in the agriculture sector is high, focusing on the agriculture sector as the primary area of intervention and on human-capital improvements and innovation, in particular, with targeted support for marginalized, small market actors, including young people and women.

USAID may also wish to consider how it could encourage partners to be more youth-sensitive, particularly through:

- Encouraging partners to apply trauma-informed approaches when working with the most impoverished youth and/or those who have experienced trauma.
- Tailoring resilience indicators at the individual, household, and community levels to specific sociocultural contexts to accurately identify critical resilience outcomes for youth (and other populations) and their predictors.
- Engaging youth in community- and systems-level resilience work, as well as nutrition education and other community-based approaches, to improving individual well-being.
- Supporting partner countries in gathering data on youth dietary, anthropometry, and micronutrient status, as well as data on factors associated with the age of onset of puberty, peak height velocity, and duration of linear growth and bone mineralization through existing community health channels. These data should be made publicly available through Ministries of Health or national statistical bureaus.
- Conducting additional research on how factors associated with vulnerability affect poverty (as measured by income and consumption) and patterns of intrahousehold allocation to explain and predict the allocation of resources to children and youth.

References

Aaberge, Rolf, and Andrea Brandolini. 2015. "Multidimensional Poverty and Inequality." In *Handbook of Income Distribution Volume 2*, edited by Anthony B. Atkinson and François Bourguignon, 141-216. Elsevier B.V.

Abbassi, V. 1998. "Growth and Normal Puberty." *Pediatrics* 507-511.

Acosta, P., and N. Muller. 2018. *The role of cognitive and socioemotional skills in labor markets.* Bonn: IZA the World of Labor.

Adam, Christopher, David Bevan, and Douglas Gollin. 2018. "Rural–Urban Linkages, Public Investment and Transport Costs: The Case of Tanzania." *World Development* 497-510.

Ali, Daniel, Klaus Deininger, and Anthony Harris. 2016. *Large Farm Establishment, Smallholder Productivity, Labor Market Participation, and Resilience: Evidence from Ethiopia. Policy Research Working Paper; No. 7576.* Washington, DC: World Bank.

Alvarado, G., M. Skinner, D. Plaut, C. Moss, C. Kapungu, and N. Reavley. 2017. *A Systematic Review of Positive Youth Development Programs in Low-and Middle-Income Countries.* Washington, DC: Making Cents International.

Amuri, N. 2015. "Enhancing Resilience of Food Production Systems Under Changing Climate and Soil Degradation in Semi-arid and Highlands of Tanzania." In *Sustainable Intensification to Advance Food Security and Enhance Climate Resilience in Africa*, edited by Rattan Lal, Bal Ram Singh, Dismas L. Mwaseba, David Kraybill, David O. Hansen and Lars Olav Eik, 385-405. Springer.

Andretti B, Goldszmidt RB, Andrade EB. How changes in menu quality associate with subsequent expenditure on (un)healthy foods and beverages in school cafeterias: a three-year longitudinal study. Prev Med. 2021; 146106456.

Andrews, Colin, Aude de Montesquiou, Ines Arevalo Sanchez, Puja Vasudeva Dutta, Boban Varghese Paul, Sadna Samaranayake, Janet Heisey, Timothy Clay, and Sarang. Chaudhary. 2021. The State of Economic Inclusion Report 2021: The Potential to Scale. . Washington, DC: World Bank.

Azzopardi PS, Hearps SJC, Francis KL, et al. Progress in adolescent health and well-being: tracking 12 headline indicators for 195 countries and territories, 1990–2016. Lancet. 2019; 393: 1101-1118.

Bahia, K., and A. Delaport. 2020. Connected Society: the state of mobile internet connectivity 2020. London: GSM Association.

Bandura, A. 1986. *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall, Inc.

Bastagli, F., J. Hagen-Zanker, L. Harman, V. Barca, G. Sturge, and T. Schmidt. 2016. *Cash transfers: what does the evidence say? A rigorous review of programme impact and the role of design and implementation features.* London: Overseas Development Institute.

Bath, Howard. 2008. "The Three Pillars of Trauma-Informed Care." *Reclaiming Children and Youth* 17-21. https://elevhalsan.uppsala.se/globalassets/elevhalsan/dokument/psykologhandlingar/trauma-informed-care.pdf.

Baxter-Jones ADG, Faulkner RA, Forwood MR, Mirwald RL, Bailey DA. Bone mineral accrual from 8 to 30 years of age: an estimation of peak bone mass. J Bone Miner Res. 2011; 26: 1729-1739.

Benson, P.L., P.C. Scales, S.F. Hamilton, and A. Sesma Jr. 2006. "Positive Youth Development: Theory, Research, and Applications." In *Handbook of Child Psychology*, 894-941. John Wiley & Sons.

Benson, T., A. Erman, and B. Baulch. 2019. "Change and rigidity in youth employment patterns in Malawi." In *Youth and jobs in rural Africa: Beyond stylized facts*, edited by Valerie Mueller and James Thurlow, 137-171. New York, NY: IFPRI, Oxford University Press.

Berger, Kathleen Stassen. 2008. *The developing person through the lifespan (7th ed.).* New York, NY: Worth Publishers.

Bjorklund, David F. 2018. "A Metatheory for Cognitive Development (or "Piaget is Dead" Revisited)." *Child Development* 2288–2302.

Black RE, et al: Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 2013; 382: 427–451.

Blattman, C., E.P. Green, J. Jamison, M.C. Lehmann, and J. Annan. 2016. "The Returns to Microenterprise Support among the Ultrapoor: A Field Experiment in Postwar Uganda." American Economic Journal: Applied Economics 35-64.

Blattman, Christopher, Nathan Fiala, and Sebastian Martinez. 2020. "The Long-Term Impacts of Grants on Poverty: Nine-Year Evidence from Uganda's Youth Opportunities Program." American Economic Review: Insights 287-304.

Bonnie, R. J., Backes, E. P., Alegria, M., Diaz, A., & Brindis, C. D. (2019). Fulfilling the promise of adolescence: realizing opportunity for all youth. Journal of Adolescent Health, 65(4), 440-442.

Bossuroy, T., Goldstein, M., Premand, P., & Vaillant, J. (2022). Yes we can! Unbundling poverty graduation programs for cost-effective impact. https://blogs.worldbank.org/impactevaluations/yes-we-can-unbundling-poverty-graduation-programs-cost-effective-impact

Brooks, Natalie, and Andrea Begley. "Adolescent food literacy programmes: A review of the literature." Nutrition & Dietetics 71, no. 3 (2014): 158-171.

Brown, Caitlin, and Dominique van de Walle. 2019. Headship and Poverty in Africa. Washington, DC: Center for Global Development.

Bryan CJ, Yeager DS, Hinojosa CP, et al. Harnessing adolescent values to motivate healthier eating. Proc Natl Acad Sci USA. 2016; 113: 10830-10835.

Burian, A, Karaya, R., J.E. Wernersson, M. Egberth, B. Lokorwa, and G. Nyberg. 2019. "community-based evaluation of population growth and agro-pastoralist resilience in Sub-Saharan drylands." *Environmental science & policy* 323-330.

Byrne, E., Kearney, J., & MacEvilly, C. (2017). The role of influencer marketing and social influencers in public health. Proceedings of the Nutrition Society, 76(OCE3).

Cabot Venton, C., C. Fitzgibbon, T. Shitarek, L. Coulter, and O. Dooley. 2012. *The Economics of Early Response and Disaster Resilience: Lessons from Kenya and Ethiopia.* London: UKaid.

Calderón, César, and Luis. Servén. 2004. *The Effects of Infrastructure Development on Growth and Income Distribution. Policy Research Working Paper; No. 3400*. Washington, DC: World Bank.

Chant, Sylvia. 2007. *Gender, Generation and Poverty: Exploring the Feminization of Poverty in Africa, Asia, and Latin America.* Northampton, MA: Edward Elgar.

Chau, M. M., M. Burgermaster, & L. Mamykina. 2018. The use of social media in nutrition interventions for adolescents and young adults—A systematic review. *International journal of medical informatics* 120, 77-91.

Chiappori, Pierre-André, and Costas Meghir. 2015. "Intrahousehold Inequality." In *Handbook of Income Distribution*, Volume 2B, 1369-1418. Elsevier, B.V.

Chong A, Cohen I, Field E, Nakasone E, Torero M. 2016. Iron deficiency and schooling attainment in Peru. *Am Econ J Appl Econ,* 8, 222-255.

Christensen, MacKenzie A. 2019. "Feminization of Poverty: Causes and Implications." In *Gender Equality (Encyclopedia of the UN Sustainable Development Goals book series (ENUNSDG))*, edited by W. Leal Filho, Anabela Marisa Azul, Luciana Brandli, Amanda Lange Salvia and Tony Wall. Springer Nature Switzerland AG.

Christiaensen, Luc, Lionel Demery, and Jesper Kuhl. 2011. "The (evolving) role of agriculture in poverty reduction--An empirical perspective." *Journal of Development Economics* 239-254.

Christian, P., and E.R. Smith. 2018. "Adolescent Undernutrition: Global Burden, Physiology, and Nutritional Risks." *Annals of Nutrition and Metabolism* 316-328. doi:https://doi.org/10.1159/000488865.

Colorado State University College of Agriculture Sciences. 2022. "Affordability of Improved Nutrition While Optimizing Economic Opportunities." *Smallholder Agriculture.* https://agsci.colostate.edu/smallholderagriculture/affordability-of-improved-nutrition-while-optimizing-economic-opportunities/

Diao, Xinshen, Josaphat Kweka, and Margaret McMillan. 2018. "Small firms, structural change and labor productivity growth in Africa: Evidence from Tanzania." *World Development* 400-415.

Diao, Xinshen, Peixun Fang, Eduardo Magalhaes, Stefan Pahl, and Jed Silver. 2019. "Cities and rural transformation: A spatial analysis of rural youth livelihoods in Ghana." In *Youth and jobs in rural Africa: Beyond stylized facts*, edited by Valerie Mueller and James Thurlow, 172-204. New York, NY: IFPRI, Oxford University Press.

Dolislager, M., Reardon, T., Arslan, A., Fox, L., Liverpool-Tasie, S., Sauer, C., & Tschirley, D. L. (2021). Youth and adult agri-food system employment in developing regions: Rural (peri-urban to hinterland) vs. urban. The Journal of Development Studies, 57(4), 571-593.

Dorinet, E., P. Jouvet, and J. Wolfersberger. 2021. "Is the agricultural sector cursed too? Evidence from Sub-Saharan Africa." *World Development.*

Dorosh, Paul, and James Thurlow. 2018. "Beyond Agriculture Versus Non-Agriculture: Decomposing Sectoral Growth–Poverty Linkages in Five African Countries." *World Development* 440-451.

Dorsey, S., K.A. McLaughlin, S.E.U. Kerns, J.P. Harrison, H.K. Lambert, E.C. Briggs, J. Revillion Cox, and L. Amaya-Jackson. 2016. "Evidence Base Update for Psychosocial Treatments for Children and

Adolescents Exposed to Traumatic Events." *Journal of Clinical Child & Adolescent Psychotherapy* 303-330.

Erikson, E. H. 1968. *Identity: youth and crisis.* New York, NY: W. W. Norton.

Falkingham, Jane, and Angela Balschieri. 2009. "Gender and Poverty: How Misleading is the Unitary Model of Household Resources? An Illustration from Tajikistan." *Global Social Policy* 43-62.

FAO. 2002. *Gender Differences in the Transitional Economy of Viet Nam.* Hanoi: FAO.

FAO, IFAD, UNICEF, WFP, and WHO. 2019. *The State of Food Security and Nutrition in the World.* Rome: FAO.

Fisher, P.J., and R. Yao. 2017. "Gender differences in financial risk tolerance." *Journal of Economic Psychology* 191-202.

Food and Agriculture Organization of the United Nations. 2015. *The State of Food and Agriculture. Social protection and agriculture: breaking the cycle of rural poverty.* Rome: FAO.

Fox, L. 2019. *Economic participation of rural youth: What matters?* IFAD.

Gillespie S, Poole N, van den Bold M, Bhavani RV, Dangour AD, Shetty P. Leveraging agriculture for nutrition in South Asia: what do we know, and what have we learned? Food Policy. 2019; 82: 3-12.

Global Data Lab. 2021. *World Poverty Map.* February 21. https://worldpoverty.io/map.

Goulden, M.C., W.N. Adger, E.H. Allison, and D. Conway. 2013. "Limits to Resilience from Livelihood Diversification and Social Capital in Lake Social–Ecological Systems." *Annals of the American Association of Geographers* 906-924.

Goyal, Aparajita, and John Nash. 2017. *Reaping Richer Returns: Public Spending Priorities for African Agriculture Productivity Growth. Africa Development Forum.* Washington, DC: World Bank and Agence Francaise de Developpement.

Hallegatte, Stephane, Mook Bangalore, and Adrien Vogt-Schilb. 2016. *Socioeconomic Resilience: Multi-Hazard Estimates in 117 Countries. Policy Research Working Paper; No. 7886.* Washington, DC: World Bank.

Hargreaves D, Mates E, Menon P, Alderman H, Devakumar D, Fawzi W, et al. Strategies and interventions for healthy adolescent growth, nutrition, and development. Lancet. 2021; (published online Nov 29.) https://doi.org/10.1016/S0140-6736(21)01593-2

Harvard Medical School. 2011. "The adolescent brain: Beyond raging hormones." The Harvard Health Blog. March. https://www.health.harvard.edu/mind-and-mood/the-adolescent-brain-beyond-raging-hormones.

Hawkes, Corinna, and Barry M. Popkin. 2015. "Can the sustainable development goals reduce the burden of nutrition-related non-communicable diseases without truly addressing major food system reforms?" *BMC Medicine.*

Hazel, C.E. 2016. *Empowered Learning in Secondary Schools: Promoting Positive Youth Development through a Multitiered System of Supports.* Washington, DC: American Psychological Association.

Heckert, J., A. Pereira, C. Doss, E.C. Myers, and A. Quisumbing. 2019. "Building Livelihoods for Rural Youth: A Gendered Perspective." In *2019 Annual trends and outlook report: Gender equality in rural Africa: From commitments to outcomes*, edited by A.R. Quisumbing, R.S. Meinzen-Dick and J. Njuki, 97-110. Washington, DC: International Food Policy Research Institute (IFPRI).

HLPE. 2021. Promoting youth engagement and employment in agriculture and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

Hoddinott, John, and Susan Horton. 2014. Post-2015 Consensus: Food Security and Nutrition Perspective. Tewksbury, MA: Copenhagen Consensus Center.

Hsu J.W., M.M. Thame, R. Gibson, et al. 2016. "Unlike pregnant adult women, pregnant adolescent girls cannot maintain glycine flux during late pregnancy because of decreased synthesis from serine." *Br J Nutr*; 115: 759-763.

Hume-Nixon, M., and H. Kuper. 2018. "The association between malnutrition and childhood disability in low- and middle- income countries: systematic review and meta-analysis of observational studies." *Tropical Medicine & Health International* 1158-1175.

IFC. 2016. *Investing in Women along Agribusiness Value Chains.* Washington, DC: IFC.

ILO the Lab and Mastercard Foundation. 2020. *Getting Africa's youth working. Taking a systems approach to create more & better jobs for young people in sub-Saharan Africa.* Geneva: ILO.

International Labor Organization. 2017. *World Social Protection Report 2017–19.* Geneva: ILO.

—. 2019 ILO Stat. October 16. *Young people are far more likely to be in working poverty. When is a job not enough?* https://ilostat.ilo.org/blog/young-people-are-far-more-likely-to-be-in-working-poverty/

—. 2021. *Child labour in agriculture.* September. https://www.ilo.org/ipec/areas/Agriculture/lang--en/index.htm.

—. 2021. *Youth Labor Statistics.* August. https://ilostat.ilo.org/topics/youth/.

—. 2022. ILO Stat. November.

—. 2022. ILO. *Global Employment Trends for Youth 2022: Investing in transforming futures for young people.* Geneva: ILO. https://www.ilo.org/publications/major-publications/global-employment-trends-youth-2022-investing-transforming-futures-young

Jacob CM, Hardy-Johnson PL, Inskip HM, et al. A systematic review and meta-analysis of school-based interventions with health education to reduce body mass index in adolescents aged 10 to 19 years. Int J Behav Nutr Phys Act. 2021; 18: 1.

Jayne, T., F.K. Yeboah, and C. Henry. 2018. The future of work in African agriculture: Trends and drivers of change. Geneva: ILO.

Keats EC, Das JK, Salam RA, et al. Effective interventions to address maternal and child malnutrition: an update of the evidence. Lancet Child Adolescent Health. 2021; 5: 367-384.

Kegan, R. 1982. The Evolving Self. Cambridge, MA: Harvard University Press.

Kerac, M., D.G. Postels, M. Mallewa, A.A. Jalloh, W.P. Voskuijl, N. Groce, M. Gladstone, and E. Molyneux. 2014. "The Interaction of Malnutrition and Neurologic Disability in Africa." *Seminars in Pediatric Neurology* 42-49.

Klasen, Henrikje, and Anne-Claire Crombag. 2013. "What works where? A systematic review of child and adolescent mental health interventions for low and middle income countries." *Social Psychiatry and Psychiatric Epidemiology* 595-611.

Klasen, Stephan. 2006. *Pro-Poor Growth and Gender Inequality (Ibero-America Institute for Economic Research (IAI) Discussion Papers 151).* Göttingen: Ibero-America Institute for Economic Research.

Klasen, Stephan, Tobias Lechtenfeld, and Felix Povel. 2011. *What about the Women? Female Headship, Poverty and Vulnerability in Thailand and Vietnam.* Paris: OECD. https://www.oecd.org/dev/pgd/46982877.pdf.

Kornet-van der Aa DA, Altenburg TM, van Randeraad-van der Zee CH, Chinapaw MJM. The effectiveness and promising strategies of obesity prevention and treatment programmes among adolescents from disadvantaged backgrounds: a systematic review. Obes Rev. 2017; 18: 581-593.

Kozuki N, et al: Short maternal stature increases risk of small-for-gestational-age and preterm births in low- and middle-income countries: individual participant data meta-analysis and population attributable fraction. J Nutr 2015; 145: 2542–2550.

Langyintuo, A. 2020. "Smallholder Farmers' Access to Inputs and Finance in Africa." In *The Role of Smallholder Farms in Food and Nutrition Security*, edited by Gomez y Paloma S., Riesgo L. and Louhichi K., 133-152. Cham: Springer.

Larson, D.F., R. Muraoka, and K. Otsuka. 2020. "Rural Development Strategies and Africa's Small Farms." In *The Role of Smallholder Farms in Food and Nutrition Security*, edited by S. Gomez y Paloma, L. Riesgo and K. Louhichi, 45-77. Cham: Springer International Publishing.

Lassi ZS, Mansoor T, Salam RA, Bhutta SZ, Das JK, Bhutta ZA. Review of nutrition guidelines relevant for adolescents in low- and middle-income countries. Ann N Y Acad Sci. 2017; 1393: 51-60.

Lassi ZS, Moin A, Das JK, Salam RA, Bhutta ZA. Systematic review on evidence-based adolescent nutrition interventions. Ann N Y Acad Sci. 2017; 1393: 34-50.

Lassi, Z., A. Moin, and Z. Bhutta. 2017. "Chapter 11 Nutrition in Middle Childhood and Adolescence." In Child and Adolescent Health and Development, 3rd Edition, edited by Donald A P Bundy, Nilanthi de Silva, Susan Horton, Dean T. Jamison and George C. Patton. Washington, DC: International Bank for Reconstruction and Development/World Bank.

Leao, Izabela, Mansur Ahmed, and Anuja. Kar. 2018. *Jobs from Agriculture in Afghanistan. International Development in Focus.* Washington, DC: World Bank.

Leroy JL, Frongillo EA, Dewan P, Black MM, Waterland RA. Can children catch up from the consequences of undernourishment? Evidence from child linear growth, developmental epigenetics, and brain and neurocognitive development. Adv Nutr. 2020; 11: 1032-1041.

Liao, C., C.B. Barratt, and K.S. Kassam. 2014. "Does Diversification Translate into Improved Livelihoods? Evidence from Pastoral Households in the Altay and Tianshan Mountains of Xinjiang, China." Social Science Research Network. December. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2628701.

Ligon, E., and E. Sadoulet. 2018. "Estimating the Relative Benefits of Agricultural Growth on the Distribution of Expenditures." World Development 417-428.

Lowe CJ, Morton JB, Reichelt AC. Adolescent obesity and dietary decision making—a brain-health perspective. Lancet Child Adolesc Health. 2020; 4: 388-396.

Mahoozi, H. 2016. "Growth elasticity of monetary and non-monetary poverty: an application to Iran." Society for the Study of Economic Inequality. June. http://www.ecineq.org/milano/WP/ECINEQ2016-403.pdf.

Mellor, J.W. 2017. *Agricultural Development and Economic Transformation.* Cham: Palgrave Macmillan.

Metelerkamp, L., S. Drimie, and R. Biggs. 2019. "We're ready, the system's not - youth perspectives on agricultural careers in South Africa." *Agricultural Economics Research, Policy and Practice in Southern Africa* 154-179.

Milazzo, Annamaria, and Dominique van de Walle. 2015. *Women Left Behind? Poverty and Headship in Africa.* Washington, DC: World Bank.

Modi, Renu. 2019. "The Role of Agriculture for Food Security and Poverty Reduction in Sub-Saharan Africa." In *The Palgrave Handbook of Contemporary International Political Economy*, edited by T.M. Shaw, L.C. Mahrenbach, R. Modi and X. Yi-chong, 391-410. London: Palgrave Macmillan.

Moore, N., D. Glandon, J. Tripney, T. Kozakiewicz, S. Shisler, J. Eyers, M.D.A. Leon, V. Kurkjian, Snilstveit B., and A. Perdana. 2020. *Effects of access to electricity interventions on socioeconomic outcomes in low- and middle-income countries.* London: 3ie.

Moores CJ, Bell LK, Miller J, Damarell RA, Matwiejczyk L, Miller MD. A systematic review of community-based interventions for the treatment of adolescents with overweight and obesity. Obes Rev. 2018; 19: 698-715.

Moyo, J. M., E. M. Bah, and A. Verdier-Chouchane. 2015. Transforming Africa's Agriculture to Improve Competitiveness. [Africa Competitiveness Report 2015.] . Geneva: World Economic Forum, World Bank and AfDB.

Mueller, V., and J. Thurlow. 2019. *Youth and jobs in rural Africa: Beyond stylized facts.* Washington, DC: IFPRI.

Nikolaou, Charoula K., Thomas N. Robinson, Kyra A. Sim, and Michael EJ Lean. "Turning the tables on obesity: young people, IT and social movements." Nature Reviews Endocrinology 16, no. 2 (2020): 117-122.

Norris SA, Frongillo EA, Black MM, et al. Nutrition in adolescent growth and development. Lancet. 2021; (published online Nov 29.) https://doi.org/10.1016/S0140-6736(21)01590-7.

Ola, K.O. 2020. "Micro-determinants of Women's Participation in Agricultural Value Chain: Evidence from Rural Households in Nigeria." In The Palgrave Handbook of Agricultural and Rural Development in Africa, edited by E.S. Osabuohien, 553-570. Cham: Palgrave Macmillan.

Olfert MD, Hagedorn RL, Clegg EN, Ackerman S, Brown C. Choice architecture in Appalachian high schools: evaluating and improving cafeteria environments. Nutrients. 2019; 11: E147.

Olusanya, B.O., S.M. Wright, M.K.C. Nair, N. Boo, R. Halpern, H. Kuper, A.A. Abubakar, et al. 2020. "Global Burden of Childhood Epilepsy, Intellectual Disability, and Sensory Impairments." Pediatrics.

Orenstein, G.A., and L. Lewis. 2020. "Eriksons Stages of Psychosocial Development." *StatPearls.* November 22. https://www.ncbi.nlm.nih.gov/books/NBK556096/.

Osabuohien, E.S., U.R. Efobi, R.T. Herrmann, and C.M.W. Gitau. 2019. "Female labor outcomes and large-scale agricultural land investments: Macro-micro evidence from Tanzania." *Land Use Policy* 716-728.

Paul, Boban Varghese, Puja Vasudeva Dutta, and Sarang Chaudhary. 2021. *Assessing the Impact and Cost of Economic Inclusion Programs: A Synthesis of Evidence. Policy Research Working Paper; No. 9536.* Washington, DC: World Bank.

Peper, J.S., and R.D. Dahl. 2015. "Surging Hormones: Brain-Behavior Interactions During Puberty." *Current Directions in Psychological Science* 134-139.

Pérez-Ferrer C, Barrientos-Gutierrez T, Rivera-Dommarco JA, et al. Compliance with nutrition standards in Mexican schools and their effectiveness: a repeated cross-sectional study. BMC Public Health. 2018; 181411.

Petry N, Olofin I, Hurrell RF, et al. The proportion of anemia associated with iron deficiency in low, medium, and high human development index countries: a systematic analysis of national surveys. Nutrients. 2016; 8: E693.

Pfefferbaum, B., R. L., Van Horn, and R. L. Pfefferbaum. 2017. "Involving adolescents in building community resilience for disasters." *Adolescent Psychiatry* 253–265.

Pickens, I.B., and N. Tschopp. 2017. *Trauma-Informed Classrooms.* Reno, NV: The National Council of Juvenile and Family Court Judges.

Popkin BM, Corvalan C, Grummer-Strawn LM. Dynamics of the double burden of malnutrition and the changing nutrition reality. Lancet. 2020; 395: 65-74.

Quinn EL, Johnson DB, Podrabsky M, Saelens BE, Bignell W, Krieger J. Effects of a behavioral economics intervention on food choice and food consumption in middle-school and high-school cafeterias. Prev Chronic Dis. 2018; 15: E91.

Qureshi, M.E., J. Dixon, and M. Wood. 2015. "Public policies for improving food and nutrition security at different scales." Food Security 393–403.

Rapsomanikis, G. 2015. *The economic lives of smallholder farmers: An analysis based on household data from nine countries.* Rome: FAO.

Riesgo, L., K. Louhichi, and S. Gomez y Paloma. 2020. "Conclusions." In *The Role of Smallholder Farms in Food and Nutrition Security*, edited by S. Gomez y Paloma, L. Riesgo and K. Louhichi, 247-251. Cham: Springer International Publishing.

Roelen, K., and S. Devereux. 2019. "Money and the Message: The Role of Training and Coaching in Graduation Programming." *The Journal of Development Studies* 1121-1139.

Rogol, A.D., P.A. Clark, and J.N. Roemmich. 2000. "Growth and pubertal development in children and adolescents: effects of diet and physical activity." *The American Journal of Clinical Nutrition* 521S–528S.

Rowe F, Stewart D, Somerset S. Nutrition education: towards a whole-school approach. Health Educ. 2010; 110: 197-208.

Sabates, R., and S. Devereux. 2015. "Evidence on Graduation in Practice: Concern Worldwide's Graduation Programme in Rwanda." *IDS Bulletin* 64-73.

Sadler RC, Clark AF, Wilk P, O'Connor C, Gilliland JA, Using GPS and activity tracking to reveal the influence of adolescents' food environment exposure on junk food purchasing. Can J Public Health. 2016; 1075346.

Salam, Rehana A., Jai K Das Das, Wardah Ahmed, Omar Irfan, Sana Sadiq Sheikh, and Zulfiqar A. Bhutta. 2020. "Effects of Preventive Nutrition Interventions among Adolescents on Health and Nutritional Status in Low-and Middle-Income Countries: A Systematic Review and Meta-Analysis." *Nutrients* 12 (49). doi:https://doi.org/10.3390/nu12010049.

Scharner S, Stengel A. Alterations of brain structure and functions in anorexia nervosa. Clin Nutr Exp. 2019; 28: 22-32.

Schmidt, E., and F. Bekele Woldeyes. 2019. "Rural youth and employment in Ethiopia." In Youth and jobs in rural Africa: Beyond stylized facts, edited by Valerie Mueller and James Thurlow, 109-136. New York, NY: International Food Policy Research Institute (IFPRI), Oxford University Press.

Scholl TO, Hediger ML. A review of the epidemiology of nutrition and adolescent pregnancy: maternal growth during pregnancy and its effect on the fetus. J Am Coll Nutr. 1993; 12: 101-107.

Shekar, M., J. Dayton Eberwein, and J. Kakietek. 2016. "The costs of stunting in South Asia and the benefits of public investments in nutrition." Maternal & Child Nutrition 186-195.

Shimeles, Abebe, Audrey Verdier-Chouchane, and Amadou Boly. 2018. "Introduction: Understanding the Challenges of the Agricultural Sector in Sub-Saharan Africa." In *Building a Resilient and Sustainable Agriculture in Sub-Saharan Africa*, edited by Verdier-Chouchane A., Boly A. Shimeles A., 1-12. Cham: Palgrave Macmillan.

Silbereisen, R.K., and R.M. Lerner. 2007. "Approaches to Positive Youth Development: A View of the Issues." In *Approaches to Positive Youth Development*, edited by R.K. Silbereisen and R.M. Lerner, 3-30. Thousand Oaks, CA: Sage Publications.

Singh, Bal, Andy Safalaoh, Nyambilila Amuri, Lars Eik, Bishal Sitaula, and Lal Rattan. 2020. *Agricultural and Natural Resource Sustainability Under Changing Climate in Africa.* Cham, Switzerland: Springer Nature Switzerland AG.

Singla, Daisy R., Ahmed Waqas, Syed Usman Hamdanib, Suleman, Nadia, Syeda Wajeeha Zafar, et al. 2020. "Implementation and effectiveness of adolescent life skills programs in low- and middle-income countries: A critical review and meta-analysis." *Behaviour Research and Therapy* 130. doi:https://doi.org/10.1016/j.brat.2019.04.010.

Sutter, M., C. Zoller, and D. Glätzle-Rützler. 2019. "Economic behavior of children and adolescents – A first survey of experimental economics results." *European Economic Review* 98-121.

Tanner, J. 1990. *Fetus into Man: Physical Growth from Conception to Maturity.* Cambridge, MA: Harvard University Press.

Thomason DL, Lukkahatai N, Kawi J, Connelly K, Inouye J. A systematic review of adolescent self-management and weight loss. J Pediatr Health Care. 2016; 30: 569-582.

Tol, W.A., S. Song, and M.J.D. Jordans. 2013. "Annual Research Review: Resilience and mental health in children and adolescents living in areas of armed conflict – a systematic review of findings in low- and middle-income countries." *The Journal of Child Psychology and Psychiatry* 445-460.

Ude, D.K. 2020. "Youth Employment Challenge and Rural Transformation in Africa." In *The Palgrave Handbook of Agricultural and Rural Development in Africa*, edited by E.S. Osabuohien, 41-66. Cham: Palgrave Macmillan.

UN Department of Economic and Social Affairs. 2021. *SDG Goal 1.* https://sdgs.un.org/goals/goal1.

—. 2021. *World Population Prospects 2019.* https://population.un.org/wpp/Download/Standard/Population/.

UNESCO Institute for Statistics. 2021. *National Monitoring: Enrollment by Level of Education.* April 23. http://data.uis.unesco.org/.

United Nations. 2021. *SDG 2: Zero Hunger.* February 15. https://unstats.un.org/sdgs/report/2020/goal-02/.

United Nations. 2021. *The Sustainable Development Goals Report 2021.* New York, NY: United Nations.

United Nations Office of the Secretary General's Envoy on Youth. 2017. *#YouthStats: Hunger and Poverty.* https://www.un.org/youthenvoy/hunger-poverty/.

Uppendahl, Jana R., Cansu Alozkan-Sever, Pim Cuijpers, Ralph de Vries, and Marit Sijbrandij. 2020. "Psychological and Psychosocial Interventions for PTSD, Depression and Anxiety Among Children and Adolescents in Low- and Middle-Income Countries: A Meta-Analysis." *Frontiers in Psychiatry.*

USAID. 2015. *Vision for Ending Extreme Poverty.* Washington, DC: USAID.

Vaughan, E. 2018. *Resilience Measurement Practical Guidance Note Series 3: Resilience Capacity Measurement.* Washington, DC: USAID, Mercy Corps.

Watters, C., and P. O'Callaghan. 2016. "Mental health and psychosocial interventions for children and adolescents in street situations in low- and middle-income countries: A systematic review." *Child Abuse & Neglect* 18-26.

Wickham CA, Carbone ET. What's technology cooking up? A systematic review of the use of technology in adolescent food literacy programs. Appetite. 2018; 125: 333-344.

World Bank. 2018. *The State of Social Safety Nets 2018.* Washington, DC: World Bank. doi:10.1596/978-1-4648-1254-5. License: Creative Commons Attribution CC BY 3.0 IGO

World Bank. Adolescents out of school (% of lower secondary school age). https://data.worldbank.org/indicator/SE.SEC.UNER.LO.ZS Date accessed: October 26, 2021.

World Health Organization. 2021. Adolescent and young adult health. January 18. https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions.

WHO. Adolescent pregnancy. https://www.who.int/en/news-room/fact-sheets/detail/adolescent-pregnancy Date: Jan 31, 2020.

Yao, R., D.L. Sharpe, and F. Wang. 2011. "Decomposing the age effect on risk tolerance." The Journal of Socio-Economics 879-887.

Yeboah, F.K., and T.S. Jayne. 2018. "Africa's Evolving Employment Trends." The Journal of Development Studies 803-832.

Yeboah, Thomas, Easther Chigumira, Innocensia John, Nana Akua Anyidoho, Victor Manyong, Justin Flynn, and James Sumberg. "Hard work and hazard: Young people and agricultural commercialisation in Africa." Journal of Rural Studies 76 (2020): 142-151.

Zhou S, Cheng Y, Cheng L, et al. Association between convenience stores near schools and obesity among school-aged children in Beijing, China. BMC Public Health. 2020; 20: 150.