Food and Agriculture Organization of the United Nations

THE STATUS OF YOUTH IN AGRIFOOD SYSTEMS

THE STATUS OF YOUTH IN AGRIFOOD SYSTEMS

Food and Agriculture Organization of the United Nations
Rome, 2025

Required citation:
FAO. 2025. *The status of youth in agrifood systems*. https://doi.org/10.4060/cd5886en

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

ISBN 978-92-5-139920-0
© FAO, 2025

Some rights reserved. This work is made available under the Creative Commons Attribution- 4.0 International licence (CC BY 4.0: https://creativecommons.org/licenses/by/4.0/legalcode.en).

Under the terms of this licence, this work may be copied, redistributed and adapted, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organization, products or services. The use of the FAO logo is not permitted. If a translation or adaptation of this work is created, it must include the following disclaimer along with the required citation: "This translation [or adaptation] was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation [or adaptation]. The original [Language] edition shall be the authoritative edition."

Any dispute arising under this licence that cannot be settled amicably shall be referred to arbitration in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL). The parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of such a dispute.

Third-party materials. This Creative Commons licence CC BY 4.0 does not apply to non-FAO copyright materials included in this publication. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

FAO photographs. FAO photographs that may appear in this work are not subject to the above-mentioned Creative Commons licence. Queries for the use of any FAO photographs should be submitted to: photo-library@fao.org.

Sales, rights and licensing. FAO information products are available on the FAO website (www.fao.org/publications) and print copies can be purchased through the distributors listed there. For general enquiries about FAO publications please contact: publications@fao.org. Queries regarding rights and licensing of publications should be submitted to: copyright@fao.org.

Cover image: © FAO/Heba Khamis

CONTENTS

Foreword ..... **xi**
Acknowledgements ..... **xv**
Abbreviations ..... **xix**
Overview ..... **xx**

INTRODUCTION

01 Introduction **1**
Background 3
Youth-inclusive agrifood systems: leveraging synergies between youth and agrifood systems 5
Conceptual framework 8
Structure of the report 15

OPPORTUNITIES MOVE FOOD FORWARD

02 The changing landscapes of youth opportunity **23**
Key messages 25
Introduction 26
Mapping where youth live 26
Climate change and rural youth prospects 37
Unpacking youth mobility 41

03 Access to assets and resources **61**
Key messages 63
Introduction 64
Social capital 65
Human capital 67
Natural capital: Land, livestock and fisheries 79
Financial capital 92
Physical capital 96

ENGAGEMENT MOVES FOOD FORWARD

04 Youth engagement and quality of work in agrifood systems **111**
Key messages 113
Introduction 114
Youth employment in agrifood systems decreases with development 116
Agrifood systems remain key for youth 132
Youth engage in more precarious work in agrifood systems 144

05 Food security, nutrition and healthy diets for rural youth **163**
Key messages 165
Introduction 166

CONTENTS

Nutritional considerations for youth-inclusive agrifood systems transformation 167
Status of youth dietary intake and food insecurity 174
Sociocultural and economic influences on youth diets 183

06 Vulnerability and resilience of youth in agrifood systems 191
Key messages 193
Introduction 194
Youth resilience and vulnerability to global economic downturns 195
Climate stresses and youth in agrifood systems 201
Youth resilience in conflict and protracted crises 207

SOLUTIONS MOVE FOOD FORWARD

07 Making agrifood systems work for youth 219
Key messages 221
Introduction 223
Increasing supply of decent jobs 226
Improving food security and nutrition 229
Strengthening youth resilience in agrifood systems 232
Increasing youth voice and agency 235
Enhancing youth skills 238
Expanding youth access to resources 242
Way forwards towards youth-inclusive agrifood systems 247

Notes 256

Appendices 295
Appendix 1. Agrifood systems typology and definition of spaces 295
Appendix 2. Methodology for global estimates of employment in agrifood systems for youth and adults 300
Appendix 3. Survey data: Data sources, definitions of variables and methodology 306
Appendix 4. Methodology to estimate the benefits of eliminating youth unemployment 311
Appendix 5. Additional figures and tables 314

Glossary 320

FIGURES

Chapter 1 1

1.1 Agrifood systems are complex and dynamic and involve a network of actors and interlinked activities....6

1.2 Youth engagement and outcomes in agrifood systems depend on the set of economic opportunities their environment offers and youth-specific characteristics....9

1.3 Agrifood systems typology allows for cross-country comparison....11

Chapter 2 23

2.1 Youth shares in populations are declining over time although absolute numbers continue to rise....28

2.2 Youth population trends vary across regions....29

2.3 A substantial share of youth reside in rural areas despite rapid urbanization....31

2.4 Youth shares in rural population are highest in countries with protracted crisis and traditional agrifood systems....32

2.5 Countries in early stages of agrifood systems transition have large shares of rural youth in their populations....33

2.6 Most rural youth live in areas with strong agricultural potential and moderate connectivity....35

2.7 Rural youth opportunities are highest in industrial agrifood systems and most constrained in protracted crisis and traditional systems....36

2.8 Climate change expected to impact agricultural productivity potential unevenly across the globe....38

2.9 Many rural youth live in areas projected to experience declines in agricultural productivity potential due to climate change....39

2.10 Rural youth living in traditional agrifood systems are most impacted by expected declining productivity from climate change....40

2.11 The share of youth aspiring to migrate internationally increased between 2015 and 2023 across most agrifood system types....44

2.12 Aspirations to migrate internationally are highest among youth, especially in protracted crisis systems, but relatively few have made plans or preparations to migrate in the next 12 months....45

2.13 Young women are more likely than young men to migrate....48

2.14 Incidence of migration peaks around age 22 for women and 25 for men....49

2.15 Rural-to-rural youth migration is prominent, particularly in countries at lower levels of economic development....50

2.16 Marriage and family are key migration reasons among both male and female youth, while male youth are more likely to migrate for employment....55

2.17 Moderate-to-severe food insecurity increases youth's plans to migrate internationally, while severe food insecurity has no significant effect....57

FIGURES

Chapter 3 61

3.1 Rural youth are less likely to complete lower secondary education than urban youth in traditional and protracted crisis agrifood systems....69

3.2 Low youth literacy rates and large gender gaps are observed in many sub-Saharan African countries....70

3.3 Youth household heads are less likely to have access to extension services....75

3.4 Young people are often outside employment, education or training, particularly young women....78

3.5 Few young people own any land....80

3.6 Young people, both men and women, acquire land mainly through inheritance....84

3.7 Young farmers generally operate smaller farms....86

3.8 Young people are more likely to experience tenure insecurity....87

3.9 In most countries, youth-headed households are less likely to own livestock....89

3.10 Across all countries, female youth are consistently more likely than male youth to own poultry, while gender patterns in ownership of other livestock vary....91

3.11 A large share of rural youth do not own a financial account....93

3.12 Youth access to mobile money accounts had increased in all regions....94

3.13 Mobile money accounts are popular among both youth and adults in many countries in traditional agrifood systems....95

3.14 Youth are more likely to use the internet than adults, except in protracted crisis agrifood systems....97

3.15 Rural youth are significantly less likely to own a mobile phone than urban youth....99

3.16 Youth-headed households are disadvantaged in access to improved seeds and fertilizer....101

Chapter 4 111

4.1 Employment in agrifood systems remains important for youth....117

4.2 Agrifood systems are a key source of employment for youth in Africa and Southern Asia....119

4.3 Agrifood systems are a critical source of employment for youth in less developed agrifood system categories....121

4.4 Youth and adults in employment and the labour force exit agriculture at a similar pace....123

4.5 Agrifood systems employment declines but remains critical for many workers in less formalized agrifood systems....125

4.6 About 15 percent of agrifood systems workers are youth, although shares differ by agrifood system....127

4.7 Youth are overrepresented in almost all agrifood systems....129

4.8 Decline in the share of youth employed in agriculture coincides with an increase in school participation....131

4.9 Agrifood systems are a major entry point for younger youth, but young men exit agrifood systems faster than young women....133

FIGURES

4.10 Off-farm agrifood systems are more important for youth i in urban areas in less consolidated agrifood systems.....136

4.11 Youth are more likely than adults to have only one job or to work in the same sector.....138

4.12 Youth allocate larger shares of their time to own and household farming.....140

4.13 Probability of youth engaging in a different sector from their parents increases as countries undergo structural transformation.....142

4.14 Young women are less likely than young men to experience intergenerational mobility outside agrifood systems.....143

4.15 Youth in agrifood systems are likely to be in vulnerable forms of employment, especially in less developed agrifood systems.....145

4.16 Youth, especially young women, are less likely to work full time.....148

4.17 Across all age cohorts, women allocate more time to unpaid and care work.....150

Chapter 5 **163**

5.1 Skeletal muscle growth peaks in the thirties for males and forties for females.....168

5.2 Youth spans sensitive periods of brain development.....170

5.3 Intake among youth is inadequate for many nutrients.....177

5.4 Risk of moderate to severe food insecurity has risen among youth.....181

5.5 Risk of moderate to severe food insecurity is higher among youth, females and rural populations.....182

5.6 Food-related autonomy and agency change with age but are influenced by sociocultural and structural factors...184

Chapter 6 **191**

6.1 Adult employment in agrifood systems increased more than youth employment during the Great Recession of 2007/08...197

6.2 Reductions in youth employment in agrifood systems during the COVID-19 crisis were driven by loss of off-farm work among young women.....199

6.3 Weather shocks affect rural youth employment differently from adult employment.....203

6.4 Rural young men work longer hours during heat stress, while young women work more during floods.....205

6.5 Subjective resilience is higher among young people in protracted crisis, while no differences are found for material resilience.....210

6.6 Young women sustain agricultural production during conflicts.....212

Chapter 7 **219**

7.1 Youth-inclusive agrifood systems demand strategies that combine broad-based transformation wi youth empowerment.....225

TABLES

Chapter 1 1

1.1 Definitions of youth adopted in the report 15

Chapter 4 111

4.1 Fewer young women are engaged in more lucrative off-farm activities 137

Chapter 5 163

5.1 Youth have higher dietary nutrient needs than other age groups 171

Chapter 6 191

6.1 Adults are more likely to work in agrifood systems in response to weather shocks than young people, while young women often sustain agricultural production 206

6.2 As people age in protracted crises their absorptive and transformative capacities decline, along with their political capital and learning 211

BOXES

Chapter 1 1

1.1 Trade-offs in agrifood systems transitions 13

1.2 Youth agency 14

Spotlight 1.1 Generational renewal in agriculture: Challenges and opportunities for declining youth populations 17

Chapter 2 23

2.1 Forced displacement 42

2.2 Youth migration to Europe – migrant characteristics and key migration determinants 46

2.3 Spatial patterns of youth migration in West and East Africa 52

2.4 Youth temporary and seasonal migration 59

Chapter 3 61

3.1 Youth representation in formal political processes 68

3.2 Education and training of young migrants, refugees and internally displaced persons (IDPs) 72

3.3 Youth-headed households 76

Spotlight 3.1 Agri-digital financial services for young farmers and agripreneurs 103

Spotlight 3.2 Youth with disabilities 106

Chapter 4 111

4.1 Youth employment and work in agrifood systems: Methodological considerations and data 115

4.2 Gender pay gaps among youth 147

4.3 Gaps in work-related social insurance and benefits 151

Spotlight 4.1 In low- and lower-middle-income countries, youth engagement in agrifood systems depends on the spaces in which they live 152

Spotlight 4.2 Child labour among the 15–17 cohort 155

Spotlight 4.3 Indigenous youth's work and access to assets and resources in agrifood systems 157

Chapter 5 163

5.1 Adolescent and youth pregnancy 173

5.2 Data gaps 175

5.3 Context and cohort-specific dietary trends 179

5.4 Body ideals influence disordered eating behaviours globally 187

5.5 Youth engagement in agrifood systems transformation for food security and nutrition 189

Chapter 6 191

6.1 Measuring material and subjective resilience 209

Spotlight 6.1 Youth radicalization and participation in armed conflicts 213

Chapter 7 219

7.1 Social protection and youth 233

7.2 Youth mainstreaming in national agricultural policies 244

© FAO/GIULIO NAPOLITANO
SCENES FROM NISHIKI MARKET, DOWNTOWN KYOTO.

FOREWORD

Youth are at the centre of a rapidly changing world. There are more youth today than at any other point in human history. If adequately nourished, educated, and equipped with the requisite resources, transparent information and opportunities to build up hopes and to access decent work, young people can drive economic transformation and global prosperity. The Status of Youth in Agrifood Systems report provides a timely and evidence-based assessment of how decent jobs and food security for youth can be achieved through agrifood systems transformation, and how empowered youth can act as catalysts for broader agrifood systems transformation. Youth need agrifood systems and agrifood systems need youth.

This report marks FAO's first comprehensive evidence-based assessment of youth engagement in agrifood systems on a global scale. It explores the multiple dynamics that shape youth experiences in agrifood systems and derives actionable and policy-oriented recommendations based on programmes, initiatives, and regulatory measures that have worked in the past.

Agrifood systems employ 44 percent of working youth and remain a key entry point for youth employment, especially in low- and lower-middle income countries, where nearly 85 percent of the 1.3 billion global youth population resides. As agrifood systems transition, off-farm agrifood system employment becomes progressively more important for working youth compared to adults and this transition to employment outside agrifood systems occurs more quickly for young men than young women.

However, the distribution of rural youth and available opportunities varies with country's stage of agrifood systems transition. Some regions are experiencing a bulging youth population, while others experience scarcity of youth in rural areas. The policy priorities for youth in these two contexts are distinct. Countries with large youth populations need policies to increase employment prospects and productivity. Low youth population contexts require policies that can attract youth to agrifood systems work and rural areas. The climate crisis adds another layer of complexity, with an estimated 395 million rural youth living in areas expected to experience declines in agricultural productivity potential, making agrifood system employment a less attractive livelihood option.

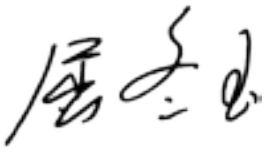
Ensuring youth integration and benefits from agrifood systems requires deliberate efforts rooted in evidence-based policies and approaches that have proven successful on two fronts. First, expanding youth economic prospects by promoting inclusive productivity growth, accelerated transformation of agrifood food systems, and overall rural and

structural transformation in ways that increase the supply of decent jobs, nutritious foods, and resilience to shocks and stresses. Second, empowering youth with agency, skills, and productive resources - including educational opportunities, land, finance, and digital technologies - to influence the agrifood systems transformation processes and partake in the outcomes. The potential payoff from such efforts is enormous: for instance, if all youth had access to decent jobs, the agrifood sector alone could add an estimated USD 670 billion to global GDP.

This report supports FAO's commitment, under its Strategic Framework 2022-31, to prioritize youth as a cross-cutting theme across all of FAO's work in transforming agrifood systems, and in fulfilling our aspiration of the Four Betters: better production, better nutrition, a better environment and a better life - leaving no one behind. FAO is unconditionally committed to stepping up its work with and for youth to ensure their voices are heard, and that their participation in and contribution to sustainable and inclusive agrifood systems are fully harnessed.

By joining forces as governments, the international development community, international organizations, private sector, civil society and of course youth themselves, we can Move Food Forward and build more efficient, inclusive, resilient, and sustainable agrifood systems for youth today, and for generations to come.

Dr QU Dongyu, *FAO Director-General*



ACKNOWLEDGEMENTS

The Status of Youth in Agrifood Systems was prepared by a team from the Rural Transformation and Gender Equality Division (ESP) of FAO under the leadership of Benjamin Davis and Lauren Phillips, under the overall guidance of Máximo Torero Cullen (Chief Economist). The report was developed under the conceptual guidance of Felix Kwame Yeboah (Assistant Professor and Director of Partnerships for Sustainable Community, Development Michigan State University) and the technical leadership of Lauren Phillips, Marwan Benali, Peter Wobst and Felix Kwame Yeboah, who coordinated the contributions prepared by FAO and academia for this report.

The core coordination team of the report included Carlo Angelico, Marwan Benali, Adriano Campolina, Francesca Dalla Valle, Benjamin Davis, Ileana Grandelis, Hitomi Ho, Alberto Marazzi, Lauren Phillips, Nicholas Sitko, Vanya Slavchevska, Peter Wobst and Felix Kwame Yeboah.

All individuals are affiliated with the ESP Division of FAO unless otherwise specified.

Chapter 1: Felix Kwame Yeboah (Michigan State University) led the research and writing team for Chapter 1 with contributions from Benjamin Davis, Lauren Phillips, Marwan Benali, Nicholas Sitko and Peter Wobst. Members of the report's core coordination team provided valuable comments and insights on earlier drafts. Spotlight 1.1 on generational renewal was authored by Nicholas Sitko. Huda Alsahi carried out the research for Box 1.2.

Chapter 2: Felix Kwame Yeboah (Michigan State University), Vanya Slavchevska, Marwan Benali and Jan Martin Rossi co-led the research and writing of Chapter 2, with additional contributions from Cristina Rapone and Jacqueline Demeranville. The data analysis and visualization for the demographic section was carried out by Jan Martin Rossi and for the migration section by Yechale Endalew. Box 2.4 was developed by Luis Becerra Valbuena and Vanya Slavchevska, with inputs from Marwan Benali. Dung Thi Phuong Le supported the cleaning of survey data and Godwin Nutsugah (University of Georgia) provided research assistance for the initial drafts. The chapter benefited from valuable comments and insights from Benjamin Davis, Lauren Phillips, Nicholas Sitko, Gustavo Anríquez (Pontificia Universidad Católica de Chile) and Peter Wobst.

Chapter 3: Vanya Slavchevska, Lauren Phillips, Huda Alsahi and Clara Mi Young Park led the research and writing team for Chapter 3. Yechale Endalew played a crucial role in providing data analyses and research assistance, as well as preparing and revising most of the chapter's figures. Nimra Azhar carried out the initial analysis for the digital

inclusion section, contributed to parts of the financial inclusion section and the individual-level analysis for the livestock section, as well as preparing Figure 3.12. Jacqueline Demeranville prepared Box 3.2. Annarita Macchioni Giaquinto carried out the analysis for Figure 3.6. Nimra Azhar and Huda Alsahi prepared Spotlight 3.1 on agri-digital financial services for young farmers and agriprenures. Lauren Phillips, Monica Romano and Libor Stloukal prepared Spotlight 3.2 on youth with disabilities.

Additionally, Ana Paula de la O Campos and Martina Improta (FAO ESA) prepared the figures derived from the RuLIS dataset included in the livestock, land and technology sections. Marzia Pafumi and Ileana Grandelis contributed to the initial draft of the Social capital section, and Marzia Pafumi further contributed to the initial drafting of the Digital inclusion section.

The authors are grateful to Haroon Akram-Lodhi (Trent University), Jessica Heckert (International Food Policy Research Institute [IFPRI]) and Ben White (International Institute of Social Studies, Erasmus University) for their invaluable and thoughtful feedback on the first draft.

Chapter 4: Marwan Benali, Natalia Piedrahita and Benjamin Davis led the research and writing team for Chapter 4, and Valentina Costa contributed to the initial draft of the chapter. Gustavo Anríquez (Pontificia Universidad Católica de Chile) carried out the analysis on intergenerational mobility and contributed to the related section. Jan Martin and Esther Heesemann played a crucial role in processing the geospatial data used in Spotlight 4.1 and the full-time equivalent data for Figure 4.12, respectively. Marwan Benali, Francesca Pastorelli, Maria Lee and Léo Keller prepared Spotlight 4.2 on child labour among the 15—17 cohort. Lauren Phillips and Mikaila Way (FAO Liaison Office for North America) prepared Spotlight 4.3 on Indigenous youth.

The authors thank colleagues who provided data instrumental to this chapter. Veronica Boero, Yonca Gurbuzer, Priti Rajagopalan and the RuLIS team (FAO ESS) kindly provided access to the "Employment in agrifood systems" microlevel data and the RuLIS harmonized data. David Bescond (ILO STATISTICS) and Stefan Kühn (ILO RESEARCH) kindly prepared and shared ILO ad hoc microdata tabulations and ILO global and regional estimates of youth employment in agriculture.

The authors also thank Ana Paula de la O Campos (FAO ESA), Nicholas Sitko, Lauren Phillips, Peter Wobst and Pierre Girard (French Agricultural Research Centre for International Development [CIRAD]) for their valuable feedback on previous versions of the chapter. The authors would also like to thank Aslihan Arslan (FAO ESA) for sharing her insights and advice on the computation of full-time equivalents.

Chapter 5: Christine Blake (University of South Carolina), Felix Kwame Yeboah (Michigan State University), and Lynnette Neufeld (FAO ESN) coordinated the research and writing of Chapter 5 with significant contributions from Edward Frongillo, Emma Kenney and Morgan Boncyk (all University of South Carolina), Annarita Macchioni Giaquinto, Erdgin Mane and Lauren Phillips. Sara Viviani and Carlo Cafiero (both FAO ESS) contributed to the food security analysis on youth. Annarita Macchioni Giaquinto, Natalia Piedrahita and Lauren Phillips prepared Box 5.1.

We gratefully acknowledge the valuable insights and feedback from Benjamin Davis, Peter Wobst, Jane Lowicki-Zucca, members of the Food and Nutrition Division (ESN) at FAO, and

Surabhi Dogra (International Association of Adolescent Health), Gahssan Mehmood (University of South Carolina), Molly O'Sullivan (Adolescent Health, Murdoch Children's Research Institute), Natasha Lelijveld (Emergency Nutrition Network, United Kingdom of Great Britain and Northern Ireland), Tolulope Jayeola (Emergency Nutrition Network, Nigeria), Daisy Liz (Emergency Nutrition Network, Uganda) and Tawanda Mukwekwezeke (Emergency Nutrition Network, Zimbabwe), who reviewed and provided comments on earlier versions of the chapter.

Chapter 6: Nicholas Sitko led the research and writing team for Chapter 6. Additional authors include Esther Heesemann and Jessika Kluth. The chapter benefited from additional input from Erdgin Mane and Wolfgang Stojetz (International Security and Development Center), who conducted the analysis of armed conflicts and youth employment, and Kamran Khan Niazi, Rebecca Pietrelli and David Laborde (all FAO ESA) who led the analysis of subjective and material resilience. Natalia Piedrahita produced Figures 6.1 and 6.2.

We are grateful to John Hoddinott (Cornell University) and Greg Collins (University of Arizona) for their comments and inputs in earlier drafts.

Chapter 7: Felix Kwame Yeboah (Michigan State University) and Hitomi Ho led the research and writing team for Chapter 7. The team comprised Marzia Pafumi, Ileana Grandelis, Valentina Sommacal, Cecile Berranger and Andrea Sanchez Enciso. The chapter also benefited greatly from contributions by Nicholas Sitko and his team on resilience interventions, Lynnette Neufeld and her team on food security and nutrition, Vanya Slavchevska on resource access, Huda Alsahi and Nimra Azhar on digital technologies, Cristina Rapone, Jacqueline Demeranville, Lukrecia Mannell and Ion Bulgac on migration, and Federico Spano and Marco Knowles on social protection. Research assistance for initial drafts was provided by Mariamma Sow (formerly Michigan State University) and Matilde Bonetta.

The methodology for estimating the gains of eliminating youth unemployment on gross domestic product and the contribution of agrifood systems was developed by Gustavo Anríquez (Pontificia Universidad Católica de Chile), with inputs from Marwan Benali, Annarita Macchioni Giaquinto and Erdgin Mane. Benjamin Davis, Lauren Phillips, Nicholas Sitko, Vanya Slavchevska, Peter Wobst and Felix Kwame Yeboah contributed to exchanges on this analysis.

We are grateful to Lauren Phillips for her overall guidance throughout the process. Special thanks go to Thomas S. Jayne (Michigan State University), Benjamin Davis, Marwan Benali, Peter Wobst and members of the Decent Rural Employment team of the ESP Division, the Office of Youth and Women (FAO OYW), and the Save the Children team who provided valuable comments and insights in earlier drafts.

Report review: The Directors and Deputy Directors of the Economic and Social Development stream of FAO provided comments. Colleagues from the Agrifood Systems and Food Safety Division (ESF) of FAO also provided comments on various sections of the report.

Expert advisory group: The report's advisory group included Elisenda Estruch-Puertas (ILO), Louise Fox (Brookings Institution), Pierre Girard (CIRAD), Jane Lowicki-Zucca, Sudha Narayanan (IFPRI), Julie Perdue and Malini Tolat (Save the Children), Carolina Trivelli (Institute of Peruvian Studies), Veronica Valdivieso (Save the Children) and Thomas Yeboah (Kwame Nkrumah University of Science and Technology, Ghana). Members of the expert advisory group provided thoughtful feedback and inputs that contributed to improving the report's structure and content at various stages of its development.

Expert consultations: An internal consultation was held in January 2024 to discuss the initial structure and thematic foci of the report. The workshop brought together colleagues from the technical teams of the ESP Division of FAO, namely the Decent Rural Employment Team, the Gender Team, the Land Tenure Team, the Right to Food Team, the Inclusive Rural Finance Team, the Rural Institutions and Territorial Development Team, the Social Protection Team and the Socio-Economic Research and Analysis Team. Colleagues from other divisions of the Economic and Social Development stream of FAO participated in and contributed to the workshop, namely Aslihan Arslan, Katia Covarrubias, Ana Paula de la O Campos (all FAO ESA) and Yonca Gurbuzer (FAO ESS).

Special thanks also to Aslihan Arslan for her insights and feedback on the initial concept of the report and the initial themes identified to be covered in the report.

Two additional consultations were held as part of the process of writing The Status of Youth in Agrifood Systems. The first consultation, conducted remotely in July 2024, discussed the report's outline and concept with youth representatives. The second consultation, held in October 2024, involved a wider range of participants. This session covered a variety of important topics, including the profile of rural youth across time and space, youth labour outcomes in agrifood systems, food security, nutrition and climate change impacts, as well as youth resilience in the face of shocks and migration. The consultation also explored key enablers of youth engagement in agrifood systems.

External participants: Angela Arevalo (World Rural Forum [WRF]); Christine Blake (University of South Carolina); Merewalesi Bogi Rokosawa (WRF); Maria Paola Boselli (La Via Campesina); Célia Bühler (Young Professionals for Agricultural Development [YPARD]); Silvia Caprara (World Farmers' Organization [WFO]); Evangelista Checkera (WFO); Alanna Coneybeare (Canadian Agricultural Youth Council); Valentine Copt (Bern University of Applied Sciences (BFH-HAFL)); Edoardo Corriere (YPARD); Giulia De Castro (WFO); Joao De Morais (WFO); Nicolas Domke Venegas (Global Youth Biodiversity Network [GYBN]); Opeyemi Elujulo (MGCY – Major Group for Children and Youth); Elisenda Estruch Puerta (ILO); Lorenzo Gentile (World Food Forum [WFF]); Wendy Geza (University of KwaZulu-Natal, South Africa); Isnawati Hidayah (WFF – Young Scientists Group); Shaik Imran Hussein Choudhary (YOUNGO – official children and youth constituency of the United Nations Framework Convention on Climate Change [UNFCCC]); Apollo Karuga (YOUNGO); Bine Liem (UN Youth Representative for Biodiversity and Food for the Kingdom of the Netherlands); Jane Lowicki-Zucca; Tafadzwanashe Mabhaudhi (University of KwaZulu-Natal, South Africa); Tiffany Marcelle (WRF); William McManiman (Canadian Agricultural Youth Council [CAYC]); Josiah Mullet Koop (CAYC); Sudha Narayanan (IFPRI); Asli Ocal (La Via Campesina); Sebastian Pedraza (YPARD); Jamie Pepper (WFO); June Pomposo (WRF); Lilaraj Raut (WRF); Ida Simonsen (UN Youth Representative for Biodiversity and Food for the Kingdom of the Netherlands); Lisa Nellie Tamtam (Global Indigenous Youth Caucus); Genna Tesdall (YPARD); Malini Tolat (Save the Children); Veronica Valdivieso (Save the Children); Yazmeen Wardman (Global Indigenous Youth Caucus) and Raymond Wauya (WRF); Felix Kwame Yeboah (Michigan State University) and Thomas Yeboah (Kwame Nkrumah University of Science and Technology, Ghana).

Internal participants within FAO: Huda Alsahi, Carlo Angelico, Ward Anseeuw, Marwan Benali, Cécile Berranger; Veronica Boero (ESS); Adriano Campolina, Valentina Costa, Tea Dabrundashvili, Francesca Dalla Valle, Benjamin Davis; Ana Paula de la O Campos (ESA); Jacqueline Demeranville, Daniele Epifanio, Ariane Genthon, Ileana Grandelis, Hitomi Ho; Tomoko Kato (ESN); Katherine Kemp (ESA); Jessika Kluth, Maria Lee, Annarita Macchioni Giaquinto, Erdgin Mane, Alberto Marazzi, Rumbidzai Ndoro; Lynnette Neufeld (ESN); Kamran

Khan Niazi (ESA); Marzia Pafumi, Clara Park, Lauren Phillips, Natalia Piedrahita; Rebecca Pietrelli (ESA); Giorgia Prati; Priti Rajagopalan (ESS); Cristina Rapone, Rodrigo Rivera, Maria Paola Rizzo, Jan Martin Rossi, Nicholas Sitko, Vanya Slavchevska, Libor Stloukal and Peter Wobst.

Editorial, communications and administrative support: Carlo Angelico led the production of the report. Fabiana De Giorgio provided support throughout the process. Bruce Ross-Larson (Communications Development, Inc) helped refine the structure of the publication and David McDonald copy-edited the content and prepared the list of abbreviations. Creative design and graphic template were provided by Futerra, while Visiontime and Art&Design Srl worked on content layout and formatting. Alberto Marazzi provided administrative support throughout the development of the report and the production process. Translations were delivered by the Language Branch (CSGL) of the FAO Governing Bodies Servicing Division (CSG). Huda Alsahi, Marwan Benali, Ileana Grandelis, Jun He, Alejandra Safa, Yahor Vetlou and Lixia Yang reviewed the translated versions of the Overview of the report. Hitomi Ho, Peter Wobst and Anna Befus prepared the Glossary for the report.

Carlo Angelico led the outreach and communications activities for the report. Fabiana De Giorgio played a central role in supporting these efforts. Fiona Funke, Emily Kitongo, Daniele Epifanio and Anna Befus contributed throughout the process. The communications campaign was crafted in collaboration with Futerra. We gratefully acknowledge the FAO Office of Communications (OCC) and the FAO Office of Youth and Women (OYW) for their support in outreach efforts. We also extend our sincere thanks to the Kingdom of the Netherlands for the financial contribution to the launch of the report.

© VISIONTIME/MELANIE BOUTROS YOUTH GATHERING AT CENTRAL PARK, ON THE SIDELINES OF THE ECOSOC INFORMAL YOUTH SUMMIT OF THE FUTURE AND LOCAL PACTS FOR THE FUTURE, NEW YORK, 2024.

ABBREVIATIONS

ABS	Access to basic services
AC	Adaptive capacity
AFA	Asian Farmers Association for Sustainable Rural Development
AI	Artificial intelligence
API	Application programming interface
BLMA	Bilateral Labour Migration Agreement
CGAP	Consultative Group to Assist the Poor
CRPD	Convention on the Rights of Persons with Disabilities
DFS	Digital financial services
D4Ag	Digitalization for Agriculture
DHD	Demographic Health Surveys
DVA	DigiFarm Village Advisor
EAS	Extension and advisory services
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field School
FPIC	Free, prior and informed consent
FSP	Financial service provider
GAEZ	Global Agro-Ecological Zone
GDP	Gross domestic product
GPS	Global Positioning System
GSMA	Global System for Mobile Communications
HALC	High agricultural potential and low connectivity
HAMC	High agricultural potential and medium connectivity
HHH	Household head
ICT	Information and communication technology
IDP	Internally displaced person
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
ILS	International Labour Standards
IOM	International Organization for Migration
IoT	Internet of Things
LAHC	Low agricultural potential and high connectivity
LAMC	Low agricultural potential and medium connectivity
LMIC	Low- and middle-income country
LSMS	Living Standard Measurement Study
MFI	Microfinance institution
MALC	Medium agricultural potential and low connectivity
MAMC	Medium agricultural potential and medium connectivity
MNO	Mobile network operator
MRC	Migrant resource centre
MSE	Mean squared error
NEET	Not in employment, education or training
NGO	Non-governmental organization
NTFP	Non-timber forest products
OLS	Ordinary least squares
OSH	Occupational safety and health
PPP	Purchasing power parity
PSNP	Productive Safety Net Program
R&D	Research and development
RAS	Rural advisory services
RIMA	Resilience Index Measurement and Analysis
RuLIS	Rural Livelihoods Information System
SERS	Subjective self-Estimated Resilience Score
SSN	Social safety nets
SUA	Setting up Aid
TVET	Technical and vocational education and training
URCA	Urban-rural catchment area
WIND	Work improvement in neighbourhood development

OVERVIEW

YOUTH NEED AGRIFOOD SYSTEMS AND AGRIFOOD SYSTEMS NEED YOUTH. AGRIFOOD SYSTEMS ARE THE MAIN SOURCE OF LIVELIHOODS IN LOW-INCOME COUNTRIES, WHERE LARGE SHARES OF RURAL YOUTH WORK IN AGRICULTURE.

In lower-middle-income countries, off-farm segments of agrifood systems provide an additional, wide range of job opportunities. In higher-income countries, where the youth population in rural areas is declining, agrifood systems are key to providing incentives for young people to revitalize rural areas. Ensuring youth-inclusive agrifood systems transformation is important both for enhancing youth welfare and building sustainable and resilient agrifood systems. **This report provides a comprehensive, evidence-based analysis of the status of youth in agrifood systems.**

The report focuses on the ability of youth to secure decent jobs, food security, and nutrition and resilience against economic and environmental shocks through their participation in agrifood systems. The report analyses generational and intersectional factors that condition the participation of youth in agrifood systems, the challenges they face, and the interventions, policies and approaches that can effectively promote youth engagement in agrifood systems.

Globally, an estimated 1.3 billion young people are between the ages of 15 and 24. Youth demographic trajectories vary across regions, reflecting differences in economic development, fertility rates and migration patterns. Youth populations remain large and continue to grow in low-income countries of sub-Saharan Africa and Southern Asia, but are smaller and shrinking in higher-income countries. Despite rapid urbanization, rural areas still accommodate 46 percent of the global youth population. While most rural youth live in areas with high agricultural productivity potential and moderate to high market access, some 395 million reside in areas projected to experience a decline in agricultural productivity due to climate change. Migration plays an important role in shaping young men and women's livelihood trajectories. Both men and women are more likely to migrate before they turn 25 years old, indicating a strong association between youth and significant social, economic and spatial transitions.

© **FAO/STUART TIBAWESWA** A SORGHUM PLANTATION WORKER IN LUWERO, UGANDA.

Improved access to assets and resources, including quality education and training, land, finance and technologies, supports young people in securing a decent wage and self-employment opportunities in agrifood systems. However, young people, and particularly rural youth and young women, frequently face challenges in accessing resources due to generational and gendered power dynamics, as well as structural, economic, social and spatial constraints. Barriers such as delayed inheritance of land, land fragmentation arising from intergenerational subdivision of land, rising land prices and limited access to capital hinder young people from establishing themselves as independent farmers and agripreneurs.

Additionally, rural youth lag behind their urban counterparts in access to social networks, education and training, limiting their wage employment prospects within agrifood systems. Young rural women are particularly disadvantaged. For example, they are more likely not to be in education, employment or training than young rural men, largely due to a higher care burden and early marriage, which contributes to economic disadvantages later in life. In rural areas in particular, digital technologies and information and communication technologies (ICTs) can help youth access and join social networks, education and training, which is critical for participation in agrifood systems. This is possible in part because young people are more connected to the internet than adults.

These constraints and opportunities condition youth participation in, and benefits from, agrifood systems, particularly in countries with traditional or protracted crisis agrifood systems, which are characterized by small-scale and subsistence farming and minimal market integration, with shorter and less complex value chains. Young people rely more on agrifood systems for employment than adults (44 percent versus 38 percent, respectively), while agrifood systems serve as a critical entry point into labour force participation for younger youth aged 15–19. Youth, and especially young women, are more likely to engage in low-skilled, poorly remunerated, precarious work. Finally, while agrifood systems often serve as a refuge in times of crises, jobs are more accessible to adults aged 25 and older

than for youth, and more for young men than for young women during economic downturns.

The period of youth is critical for cognitive growth and development, influenced by changes in nutrient requirements. However, globally, almost one in four youth experience food insecurity, and following the COVID-19 pandemic, food insecurity has increased more rapidly among youth than among adults.

Youth inclusion in agrifood systems is a fundamental aspect of "leaving no one behind" and is critical for helping young people meet their aspirations and achieve their goals. Achieving youth-inclusive and more sustainable agrifood systems requires the expansion of economic opportunities in the broader economy while implementing youth-targeted strategies that equip young people with the skills, agency and resources needed to thrive. In lower-income countries seeking to benefit from the demographic dividend of a **large youth population**, broad-based productivity growth and an increased youth skills base, as well as access to productive resources, will be key to enhancing the economic prospects of young people and transforming agrifood systems. Higher-income countries, or those experiencing **labour scarcity with lower shares of rural youth**, will have to invest in motivating young women and men to engage in agrifood systems. In such contexts, economic incentives alone are not sufficient to attract youth to agrifood systems. Rather, policies must address economic, social, psychological and institutional factors that impede generational renewal, and be attentive to competing interests and trade-offs that exist across generations and between urban and rural populations.

WHERE DO YOUTH LIVE?

Nearly 85 percent of the world's 1.3 billion youth live in low- and lower-middle-income countries. Sub-Saharan Africa has a youth share higher than the global average of 15.8 percent and expects a 65 percent increase in its youth population by 2050, reaching 400 million. In North Africa, Southeast Asia, Western and Central Asia, and Latin America and the Caribbean, youth represent one in six people. Conversely, in East Asia, Europe and North America, youth populations represent less than one in ten people. These divergent trends present both opportunities and challenges and will shape the transformation of agrifood systems. A growing youth population can drive economic transformation and innovation. However, if constraints and structural barriers are not addressed, high levels of youth unemployment are likely to lead rural out-migration, frustration and even social unrest. Furthermore, as young generations drive social change, diversity and creativity, a decline in their numbers threatens the social, cultural and economic vitality of rural areas.

Despite rapid urbanization, rural areas still accommodate 46 percent of the youth population. Almost 60 percent of rural youth globally live in peri-urban areas, located outside of city limits but within an hour's travel to urban centres. These areas represent a blending of urban and rural life, influenced by urban expansion driven by population growth and migration, and also serve as a crucial bridge between urban demand and rural production. A lower proportion of rural youth – just over one-third – live in peri-rural areas, followed by rural hinterlands (6 percent).

The role of youth in shaping agrifood systems evolves as agrifood systems transition and the youth population declines, presenting both challenges and opportunities. Youth shares in rural populations are highest in countries with traditional (18.4 percent) or protracted crisis agrifood systems (19.4 percent). In these countries, agriculture is often the primary livelihood defined by labour-intensive practices, limited adoption of modern technologies and limited market integration. These hurdles, compounded by low wages and poor working conditions, often deter young people from pursuing careers in agrifood systems. In protracted crisis settings, political instability, conflict and environmental vulnerability exacerbate these constraints. As agrifood systems diversify, formalize and industrialize, the share of youth in the rural population further reduces (11.4 percent in industrialized agrifood systems), as increased urbanization and the shift toward off-farm employment provide new opportunities for youth to engage in higher-value agribusiness activities and technological innovations. However, if agrifood systems are not competitive, rural youth may choose to migrate permanently to urban areas or other sectors, posing a threat to the viability of rural economies.

Most rural youth live and work in areas with high agricultural productivity potential[a] and moderate to high market access. In these areas, lack of connectivity represents a more binding constraint than lack of agricultural potential. Although a majority of young people live in locations with high agricultural productivity potential, only around one-third reside in areas classified as having high connectivity, defined by robust market access, infrastructure and services. This opportunity space is unequally distributed: in protracted crisis agrifood systems, only 2 percent of rural youth live in areas with the highest agricultural potential and market accessibility, compared to over half of rural youth in industrial agrifood systems. Twenty percent of youth in countries in protracted crisis agrifood systems face severe challenges in terms of opportunity space, far higher than in other types of agrifood systems.

Agrifood systems are highly susceptible to environmental degradation and the multifaceted impacts of climate change. **An estimated 395 million rural youth, representing 69 percent of the global rural youth population, currently reside in areas projected to experience declines in agricultural productivity potential due to adverse effects from climate change.** Among them, 111 million live in areas expected to have the poorest land quality. The impact of declining land productivity is unevenly distributed, with sub-Saharan Africa and Western Asia bearing the brunt of this challenge due to their large rural youth populations. Youth living in Europe, North America and parts of East Asia face the least impact.

Youth are highly mobile, with higher rates of migration than adults. Migration of youth is connected to other key life transitions, including entry into employment, pursuit of higher education, and marriage (particularly for young women), especially since better education and employment opportunities are often located in urban areas. Multiple temporary and seasonal migrations are common among rural youth in low- and middle-income countries, with some youth returning to rural areas and engaging in farming as adults. Internal migration often serves as a complement, rather than a replacement, for agricultural livelihoods.

Youth consistently show higher aspirations to migrate internationally than adults. In countries with traditional or protracted crisis agrifood systems, male youth are more likely than female youth to aspire to migrate; however, relatively few have plans or made preparations to migrate in the next 12 months. Both male and female youth aspirations to migrate were higher in 2023 than they were in 2015 across all types of agrifood systems. Unemployment and food insecurity are leading factors in the international migration of youth. The probability of internal migration is higher among young women than among young men, often for reasons linked to marriage and family.

© FAO/TAMIRU LEGESSE IN THE AMHARA REGION OF NORTHERN ETHIOPIA, YOUNG PEOPLE RUN VEGETABLE GARDENS WITH THE SUPPORT OF FAO, CREATING LOCAL OPPORTUNITIES AND REDUCING THE NEED TO MIGRATE.

YOUTH INCLUSION IN AGRIFOOD SYSTEMS IS A FUNDAMENTAL ASPECT OF 'LEAVING NO ONE BEHIND' AND IS CRITICAL FOR HELPING YOUNG PEOPLE MEET THEIR ASPIRATIONS.

a Agricultural potential is defined through a measure of land productivity potential derived from FAO's Global Agro-Ecological Zones (GAEZ) data. It represents the maximum possible yield for specific crops under certain agroclimatic, soil and terrain conditions, as well as specific management assumptions.

© FAO/GIULIO NAPOLITANO
IN MALE, MALDIVES, A YOUNG WOMAN PROCESSES STEAMED SKIPJACK TUNA AT THE ENSIS CANNERY.

YOUTH ACCESS TO PRODUCTIVE ASSETS AND RESOURCES

Young people face structural, economic, social, legal, and spatial challenges in accessing assets and resources essential for securing decent work in agrifood systems. Despite improvements in education globally over the last several decades, **rural youth continue to have lower access to quality formal education compared with their urban peers:** across all types of agrifood systems, 74 percent of rural young people compared with 85 percent of urban young people complete lower-secondary education. Only 20.5 percent of rural girls in protracted-crisis agrifood systems complete lower-secondary education, compared with over 50 percent of their male and female peers in urban areas, and 98 percent of girls in industrial agrifood systems. In many low- and middle-income countries, students who attend schools often leave without the skills required for better remunerated on- and off-farm jobs, creating a disconnect between education and local labour market demand. Globally, only 13.6 percent of youth have completed vocational education intended to address skills gaps. Young men and women are also disadvantaged in access to agricultural extension and advisory services, which tend to target the household head, typically an older man.

Over 20 percent of young people globally were not in education, employment or training (NEET) in 2023, with young women accounting for two-thirds of youth in NEET. Greater unpaid and domestic care responsibilities keep young women in NEET, with young migrant women the most likely to fall into that category. For young women, being in NEET during youth often results in cumulative disadvantages throughout their lives, reducing their likelihood of decent employment in later years.

Young people who want to farm face constraints in accessing land. High land prices, limited savings and inadequate access to credit make land ownership unattainable for many young people. In many contexts, particularly in sub-Saharan Africa and parts of Asia, fewer young people are inheriting land or are inheriting smaller plots of land due to increasing land scarcity and fragmentation. Those who do inherit often receive land later in life, since aging farmers – with little access to pensions or social assistance – may hold onto their land until they are no longer able to work it. Patriarchal customs and inheritance laws disproportionately favour men, further restricting young women's access to land.

Youth are more likely to be unbanked than older generations, especially in rural areas of low- and middle-income countries. In 2021, only 66 percent of youth had a formal financial account, compared to 79 percent of adults aged 25 and over. Mobile money provides an alternative for youth to access financial services, yet significant gaps remain between mobile money account ownership and actual usage.

©FAO/NIKOS ECONOMOPOULOS/MAGNUM PH IN NEFZA, TUNISIA, YOUTH ARE RUNNING A 20-HIVE BEEKEEPING ENTERPRISE ON LAND THAT WAS EVACUATED AFTER THE CREATION OF AN ARTIFICIAL LAKE. THE ACTIVITY IS PART OF AN INITIATIVE BACKED BY FAO TO PROMOTE RURAL DIVERSIFICATION, YOUTH EMPLOYMENT AND FOOD SECURITY.

Young farmers aspire to engage in modern agriculture that relies on improved technology, including machines and digital technologies. Digital technologies not only have broad appeal among young people but also facilitate youth access to finance and markets and help to reshape their perception of agriculture. Globally, youth are more digitally connected than older populations: around 81 percent of young people aged 15–24 use the internet, compared with 68 percent of adults aged 25–74. Digital technologies not only facilitate access to information but also revolutionize agricultural practices, allowing young farmers and agripreneurs to engage in contract farming, direct marketing, logistics coordination and networking, and to access funding opportunities, thereby incentivizing generational renewal in agrifood systems with declining youth populations.

> **“YOUNG MEN AND WOMEN ARE DISADVANTAGED IN ACCESS TO AGRICULTURAL EXTENSION AND ADVISORY SERVICES, WHICH TEND TO TARGET THE HOUSEHOLD HEAD, TYPICALLY AN OLDER MAN.**

© FAO/SANJA KNEŽEVIĆ
ISIDORA ĆOSIĆ, A YOUNG FARMER, FEEDS HER COWS AT HER FAMILY FARM IN MIONICA, SERBIA.

©FAO/VEEJAY VILLAFRANCA
FAO AND THE PHILIPPINE DEPARTMENT OF AGRICULTURE USED DRONES TO SURVEY DAMAGED RICE CROPS IN PAMPANGA.

YOUTH EMPLOYMENT AND WORK IN AGRIFOOD SYSTEMS

Agrifood systems are a key source of livelihoods for youth, especially in less formalized agrifood systems. Globally, 44 percent of working youth and 38 percent of working adults were employed in agrifood systems in 2021. The share of working youth in agrifood system employment declines as agrifood systems transition, ranging from 82 percent in protracted-crisis agrifood systems to 23 percent in industrial agrifood systems. Since 2005, the global shares of working youth and adults in agrifood-systems employmen have decreased by about 10 percentage points, driven mainly by decreases in agricultural employment. Across different types of agrifood systems, employed youth and adults exit agriculture at a similar pace.

Agrifood systems are a larger source of employment for young women than for young men, across all types of agrifood systems. The share of young women engaged in agriculture is larger than their male counterparts for most age cohorts and types of agrifood systems. As agrifood systems transition, off-farm agrifood-system employment becomes increasingly more important for young women compared to young men.

Agrifood systems are key entry points to the labour market for younger youth. Approximately 76 percent of young men and 66 percent of young women aged 15–19 work in agrifood systems in protracted crisis, compared with 66 percent of young men and 63 percent of young women aged 20–24. Similarly, in industrial agrifood systems, 25 percent of young working men and 29 percent of young working women aged 15–19 work in agrifood systems, compared with 13 percent of young working men and 11 percent of young working women aged 20–24. As agrifood systems transition, the entry point shifts from agriculture to off-farm agrifood-systems employment.

Youth, and especially younger youth, are less likely to have another economic activity outside agrifood systems. As they grow older, youth diversify and/or eventually exit agrifood system employment. Intergenerational economic mobility outside of agriculture is more likely, particularly for young men, in contexts of higher agricultural labour productivity growth.

Youth, and especially young women, engage in more precarious work in agrifood systems than adults. Young women are less likely to work full time, especially in less transformed agrifood systems. Across most types of agrifood systems, young women are more likely than young men to remain outside the labour force and not in school, in part because they allocate almost three times more time than young men to unpaid and domestic work.

© FAO/LUIS TATO
IN SIAYA COUNTY, KENYA, CELESTINE ACHIENG AND A FRIEND FEED CHICKENS AT THEIR HOME POULTRY FARM.

FOOD SECURITY AND NUTRITION

Youth is a pivotal stage of growth, demanding high dietary energy and nutrients due to rapid physical and cognitive development, lifestyle shifts and increased activity. During this time, the brain continues to mature, bone mass peaks and autonomy over food choices expands. Youth access to diverse, nutritious foods and education on healthy diets not only shapes healthy eating habits but also enhances cognitive development, work readiness, economic stability and contributions to agrifood systems development.

Yet, food insecurity and malnutrition are common among youth and are rising globally. Data from 97 countries show that youth food insecurity increased from 16.7 percent (2014–2016) to 24.4 percent (2021–2023), with Africa experiencing the highest levels (42.7 percent) and Asia and the Pacific seeing the sharpest rise.

Rural youth, particularly in traditional and protracted-crisis agrifood systems, face greater food insecurity. Young females are more vulnerable, especially in emerging and diversifying agrifood systems. Urban youth generally have better access to diverse, nutrient-rich diets than their rural counterparts. Youth dietary patterns are also generally poor, marked by low fruit and vegetable intake and high consumption of soft drinks and fast food, leading to nutrient deficiencies, particularly in iron, zinc, calcium and iodine. Many youth struggle to translate healthy eating intentions into action due not only to affordability, but also impulsivity and susceptibility to marketing strategies that reinforce an unhealthy eating culture. The full extent of youth nutrient deficiencies is unknown due to substantial data gaps.

Youth-inclusive agrifood systems transformation can lay the foundation for healthier diets and reduced food insecurity. This requires a rights-based approach that ensures access to healthy diets, prioritizes youth nutritional needs and ensures affordable access to nutritious foods.

> “YOUTH IS A PIVOTAL STAGE OF GROWTH, DEMANDING HIGH DIETARY ENERGY AND NUTRIENTS DUE TO RAPID PHYSICAL AND COGNITIVE DEVELOPMENT, LIFESTYLE SHIFTS AND INCREASED ACTIVITY.

© FAO/LUIS TATO
A YOUNG FARMER OBSERVES HIS CROPS FROM A TRACTOR NEAR NYAHURURU, KENYA.

RESILIENCE AND ADAPTATION TO SHOCKS

The effects of economic downturns and climate stressors on youth employment in agrifood systems differ in important ways from adults, highlighting both their resilience and vulnerabilities. Economic downturns are shown to more adversely affect youth employment in agrifood systems than adult employment. During the COVID-19 pandemic, for example, youth employment in agrifood systems declined by 2 percent, driven by a decline in employment for young women, but increased by 3 percent among adults. Climate stressors impact the ability of youth to access employment in ways that are also distinct from adults, with differences observed across the types of climate stresses they experience. For example, extreme heat events increase the likelihood that rural youth will work, often to compensate for a reduction in adult labor. Conversely, youth are more likely to exit employment following extreme precipitation events, while employment increases among adults.

Young women play a critical role in sustaining agrifood systems in the face of shocks and stresses, but also face significant challenges. During droughts and extreme precipitation events, young rural women are more likely to be employed, mostly in agricultural employment, than young men. Similarly, when exposed to armed conflicts, the likelihood of young women working increases, working longer hours in agriculture than young men, due to the temporary absence or permanent loss of male breadwinners. However, their employment in agrifood systems tends to be more precarious than that of young men. For example, during the COVID-19 economic downturn, young women's employment in agrifood systems declined by 7 percent, while employment of young men remained unchanged.

In protracted crises, youth have greater belief in their capacities to adapt, transform and absorb shocks and stressors than adults. Life in protracted crises takes a severe toll on people's economic and psychological well-being. Yet, evidence from Palestine, Somalia, South Sudan and Yemen shows that despite these challenges, youth maintain a higher level of subjective resilience – a measure of their beliefs in their own capacities to deal with shocks and stressors focusing on their adaptive, transformative, absorptive and anticipatory capacities – than older people. This resilience is driven by a belief in their ability to bounce back from shocks, diversify their incomes to respond to future challenges and learn from past experiences. Harnessing the flexibility and optimism of youth is key to improving the lives and livelihoods of people living in protracted crises.

© FAO/HEBA KHAMIS
IN EGYPT'S SHARQIA REGION, RETAIL TRADER OM WALEED SOURCES HER GOODS FROM THE BELBEIS WHOLESALE MARKET.

MAKING AGRIFOOD SYSTEMS WORK FOR YOUTH

Youth-inclusive agrifood systems are essential to achieve the Sustainable Development Goals. The participation of youth in agrifood systems benefits youth, but is also key for the sustainability and resilience of agrifood systems. Agrifood systems transformation is strongly interlinked with broader rural and structural transformation processes in which youth participate through their labour, advocacy and consumption patterns.

Youth-inclusive agrifood system transformation requires a mix of policies and programmes that support broad-based transformation as well as a more specific focus on on youth empowerment. Broad-based transformation of agrifood systems is needed to advance three critical outcomes: expanding the supply of decent jobs, improving the food security and nutrition of youth, and strengthening their resilience to shocks. Where empowerment is concerned, three types of interventions are needed: initiatives that help youth to experience greater voice and agency, to access training and improve their skills, and to acquire improved access to resources.

On- and off-farm productivity growth is key to making agrifood systems work for youth, raising incomes and creating quality jobs across the wider economy. Achieving productivity growth requires dedicated investments in research and development to create innovations and technologies that are adapted to local contexts and resilient to shocks, robust extension services, and physical and digital infrastructure. Evidence also suggests that youth employment in agrifood systems increases most quickly when the broader enabling environment for agriculture improves, and that firm-level interventions supporting established agribusinesses with high-growth potential may generate more sustained employment for youth than those supporting specific youth-led enterprises.

Decent jobs for youth require specific actions. While adopting international labour standards is often costly and difficult in highly informal agrifood systems, awareness-raising initiatives and monitoring mechanisms that include youth stakeholders have proven successful. Voluntary standards from the private sector, such as third-party certification programmes, can also contribute to the creation of decent jobs with adequate enforcement to ensure compliance. More broadly, the formalization of agrifood systems – achieved through methods such as streamlining regulations, reducing costs and registration burdens, or linking governmental incentives to formalization – enhances enforcement of labour laws and can contribute to an increase in decent jobs for youth.

Supporting youth nutrition and healthy diets requires policies and approaches adapted to their age group. Programmes that target children – such as nutrition education and school meals – can prepare youth to make better choices about food later in life. Integrated programmes that combine education and tailored

messaging with changes in the food environment, including improved access to nutritious food and restrictions on advertisements promoting unhealthy food culture, tend to yield positive nutritional outcomes. Social media is an effective tool for engaging youth in health and nutrition education, but there is also a need for policies that target specific nutrition challenges facing youth in different types of agrifood systems (e.g. young women's micronutrient deficiencies or youth obesity).

Supporting youth resilience is critical given the differentiated ways in which youth respond to shocks. Training programmes and access to greater information through ICTs and digital platforms can support the ability of youth to withstand shocks. Social protection is critical for youth due to their limited access to more traditional forms of finance. Access to decent off-farm jobs and safe migration opportunities – both permanent and seasonal – is critical for resilience. Finally, social networks, community organizations and cooperatives can support youth resilience.

Increasing youth agency and voice allows for an accurate reflection of their needs and realities in the transformation of agrifood systems. This is particularly important for rural and marginalized youth, including young women, who tend to be excluded from institutional platforms. Collective action – including formal producers' organizations, cooperatives and community organizations – can help young people pool their resources, expand their influence and navigate power relations more easily. Youth agency can also be positively impacted by acquiring human and social capital: for example, intergenerational collaboration through mentoring can add to their skills and networks while also facilitating the transfer of knowledge and experience across generations.

Many youth interventions in agrifood systems focus on skills and training. Those that have proven to be most successful provide integrated support, emphasize hands-on learning or focus on practical experiences, are tailored to the local context and market conditions, and address intersectional factors like gender and socioeconomic background. Rural advisory services and agribusiness training, as well as integration of ICTs, have proven critical in many countries. Long-term investment in education and technical and vocational education is a prerequisite for productive youth inclusion in agrifood systems and skills acquisition.

Access to assets and resources is often best achieved through combined interventions comprising, for example, training, finance and agricultural inputs. Access to land shapes youth engagement in farming and agrifood system livelihoods, while also influencing their decisions to pursue off-farm employment locally or in distant places. Policies should facilitate youth access to land, including through youth-targeted land and credit schemes that enable young agripreneurs to purchase or rent land at affordable prices. Governments can also allocate land to youth agricultural enterprises by implementing schemes such as land banks that allow unused or underutilized land to be leased to young farmers. However, such initiatives should be complemented with other support services, including extension and advisory services, enhanced access to finance, and connections to markets to effectively deliver meaningful engagement and sufficient decent employment for youth.

Addressing barriers to youth engagement in agrifood systems and incentivizing youth entry are essential to foster generational renewal in countries with declining and ageing rural populations. Older farmers are often unwilling to cede control over their farms to younger generations due to financial uncertainty and/or a perceived loss of identity and standing in their communities. At the same time, land prices and administrative obstacles to acquiring agricultural land in these contexts represent major constraints. Economic incentives for young farmers to access land and for older farmers to cede land are not sufficient to foster generational renewal. They must be integrated with complementary interventions aimed at facilitating the integration of young farmers into farm business management, promoting positive perceptions of farming as an occupation and strengthening the integration of young people into rural communities.

More empirical evidence and age- and gender-disaggregated data are needed to capture the realities of youth in agrifood systems, and to better assess the effectiveness and impacts of programmes on youth productive engagement, food and nutrition security, and resilience. Enhanced knowledge of the status of youth in agrifood systems can shed more light on both systemic barriers and emerging opportunities for youth, as well as factors affecting their engagement in agrifood systems. Evidence-based policies and targeted investments can

improve youth welfare and harness their potential for inclusive, equitable and sustainable agrifood systems transformation worldwide.

This report demonstrates that a youth-inclusive agrifood system, one that provides decent jobs, healthy diets and food security while bolstering both youth and agrifood systems resilience, is both achievable and vital to addressing the challenges faced by today's young people. Realizing this vision, however, demands robust commitments from diverse stakeholders, and a multifaceted approach to supporting youth empowerment and the broader structural change that improves economic prospects. Doing so is beneficial both for youth and for agrifood systems.

©FAO/ALEX WEBB/MAGNUM PH IN NUEVA SONORA, CHIAPAS, MEXICO, LUIS GUSTAVO HELPS RUN HIS FAMILY'S FAO-SUPPORTED FARM USING COMPOST, IRRIGATION, CHICKENS, AND SHEEP TO BOOST INCOME, ELIMINATE DEBT AND FUND HIS UNIVERSITY STUDIES.

NUMERICAL HIGHLIGHTS

1. Nearly **85 percent** of the global youth population aged 15–24 reside in low- and lower-middle-income countries.

2. As agrifood systems transition, the share of the rural population under the age of 25 decreases. In countries with protracted-crisis agrifood systems, rural children and youth under the age of 25 represent **47 percent** of the population, compared to **5 percent** in countries with industrial agrifood systems.

3. About **395 million** rural youth live in areas expected to experience declines in agricultural productivity potential due to climate change.

4. Most rural youth live and work in areas with high agricultural productivity potential and moderate to high market access. Opportunities, however, are very unequal: only **2 percent** of youth in countries with protracted crises live in areas of greatest opportunity compared to **over half** in industrial agrifood systems.

5. International migration among youth grew over recent decades from **22.1 million** migrants aged 15–24 in 1990 to **31.7 million** migrants in 2020. Youth account for **16.2 percent** of migrants in sub-Saharan Africa, and **15.2 percent** in Latin America and the Caribbean.

However, most youth migration takes place within national borders, with rural-to-rural migration particularly prevalent in lower-income countries.

6. Globally, over **20 percent** of youth were not in education, employment or training (NEET) in 2023, with young women accounting for **two-thirds** of youth in NEET. Greater unpaid and domestic care responsibilities contribute to keeping young women in NEET.

Rural youth, and young women in particular, have lower access to formal education compared with their urban peers. Only **20.5 percent** of rural girls in countries with protracted-crisis agrifood systems complete lower-secondary education, compared to over **50 percent** of their male and female peers in urban areas, and **98 percent** of girls in countries with industrial agrifood systems.

7. Globally, youth are more digitally connected than adults, but disparities persist. **Eighty-one percent** of youth use the internet, compared to **68 percent** of adults. This gap decreases as agrifood systems transition from traditional to industrial systems.

Digital access varies widely by agrifood system. In industrial agrifood systems, **98 percent** of youth use the internet compared to **34 percent** in traditional agrifood systems.

8. Agrifood systems are a major employer of both youth and adults. Globally, **44 percent** of working youth and **38 percent** of adults are employed in agrifood systems. For both youth and adults, this represents a decline of about **10 percentage points** from 2005 to 2021, driven almost exclusively by a reduction in employment in primary agricultural production.

Agrifood systems represent a key entry point for youth employment. Across almost all types of agrifood system, youth aged 15–19 have the highest share of participation. **Seventy-six percent** of young men and **66 percent** of young women aged 15–19 in countries with protracted-crisis agrifood systems, and **25 percent** of young men and **29 percent** of young women aged 15–19 in countries with industrial agrifood systems, work in agrifood systems. Entry point shifts from agriculture to off-farm agrifood-system employment as agrifood systems transition.

9. The share of working youth in agrifood- system employment declines as agrifood systems transition, ranging from **82 percent** in protracted crisis to **23 percent** in industrial agrifood systems. As agrifood systems transition, off-farm agrifood-system employment becomes progressively more important for working youth compared to adults. **Twenty-one percent** of youth versus **8 percent** of adults work in off-farm agrifood system employment in countries with industrial agrifood systems.

10. Globally, food insecurity of youth increased from **16.7 percent** (2014–2016) to **24.4 percent** (2021–2023), with Africa experiencing the highest level (**42.7 percent** in 2021–2023), compared to **9.7 percent** in Europe and North America over the same period.

11. Economic downturns affect youth employment in agrifood systems more adversely than adult employment. During the COVID-19 pandemic, youth employment in agrifood systems declined by **2 percent**, but increased by **3 percent** among adults. This decline was driven by young women, whose employment declined by **7 percent.**

12. Eliminating youth unemployment and providing employment opportunities for youth aged 20–24 years old who are currently NEET would increase global GDP by **1.4 percent**, or **USD 1.5 trillion**. Agrifood-systems employment, providing additional 87 million jobs to unemployed and NEET youth, would contribute about **45 percent** of this estimated increase, corresponding to **USD 680 billion.**

POLICY HIGHLIGHTS

1. Achieving youth-inclusive agrifood systems requires **expanding economic opportunities** in the broader economy while implementing **targeted strategies** that equip young people with the necessary skills, agency and resources.
2. **Investments** in modernization, infrastructure and value chain development are essential to making agrifood systems a more attractive and sustainable career path for youth.
3. **Access to quality education** and skills development in rural areas remains crucial for improving labour productivity and enabling youth to seize economic opportunities. Targeted education, skills and training are also needed to prepare youth for careers in agrifood systems.
4. Policies that facilitate **youth access to productive resources**, including youth-targeted land and credit schemes that enable young farmers and agripreneurs to purchase or rent land at affordable prices, are needed to enhance youth engagement in agrifood systems.
5. **Youth migration** can contribute to inclusive agrifood system transitions by addressing labour shortages and fostering innovation. Realizing this potential, however, requires investment in safe, orderly and youth-responsive migration pathways that meet young people's specific needs and challenges.

> **ACCESS TO LAND SHAPES YOUTH ENGAGEMENT IN FARMING AND AGRIFOOD SYSTEM LIVELIHOODS, WHILE INFLUENCING THEIR DECISIONS TO PURSUE OFF-FARM EMPLOYMENT.**

©FAO/GMB AKASH ANOWAR COLLECTS GREEN MUSSELS FROM THE SEA IN KHORUSKUL, BANGLADESH.

6. **Youth agency** and visibility in policymaking spaces can be strengthened through participation in youth-led organizations and networks. Intergenerational relational approaches within local communities, like mentorship, can facilitate the transfer of resources, knowledge, skills and networks, and help to build youth resilience to shocks and stressors.
7. **Addressing existing barriers to agency, education and resource access for more disadvantaged, vulnerable or marginalized groups of youth**, including poor and rural youth, young women, youth with disabilities, Indigenous youth, and young migrants and refugees, is critical to foster equitable participation opportunities in agrifood systems.
8. **Aligning training with local market conditions** and combining it with access to resources and services, has positive impacts on youth employment outcomes in agrifood systems. Training programmes should emphasize hands-on, practical activities and reflect young people's preferences, circumstances and evolving needs.
9. **Improving working conditions for youth in agrifood systems** requires broader reforms that promote the

progressive formalization of economies, address widespread labour rights violations, including child and forced labour, enhance workplace safety, increase youth awareness of their rights and strengthen social protection systems for all.

10. **A stronger enabling environment** for agrifood systems leads to higher returns to agricultural labour and lower poverty rates for rural youth. Supporting established high-potential agribusinesses, through access to credit, training and infrastructure, can further boost youth job opportunities and promote economic stability.
11. Social media and mass media campaigns can mobilize the **political and consumer power of youth to spread nutrition messages** and improve diet quality and the eating habits of young people.
12. While nutrition policies often focus on infants and younger children, there are gains to be made in focusing on **youth-specific nutrition policies.** Policies that support youth involvement in food-related decisions, such as food acquisition and preparation, may foster better dietary choices and health outcomes.
13. Targeting youth with **anticipatory social protection programmes** is critical for building their **resilience to shocks**, protecting assets, and sustaining consumption and productive activities. In low-income and youth-abundant countries, social protection can help young people to cope with economic and climatic shocks. In youth-scarce countries, social protection can encourage young people to remain in agriculture and rural areas.

© **FAO/LUIS TATO** YOUNG TRAINER AT A HERBS AND SPICES FARM IN KAMBURU, KENYA.

> **DIGITAL TECHNOLOGIES CAN HELP RURAL YOUTH ACCESS SOCIAL NETWORKS, EDUCATION AND TRAINING CRITICAL FOR PARTICIPATION IN AGRIFOOD SYSTEMS.**

14. **Expanding access to and usage of digital technologies** promotes the modernization of agricultural practices and provides young farmers and agripreneurs with greater access to markets, information, finance and networking opportunities.
15. Significant age and sex-disaggregated **evidence and data gaps** remain regarding access to productive assets and services, climate change adaptation and resilience, and nutrition. Age-disaggregated data that also captures other characteristics – such as disability, ethnicity or other vulnerabilities – is also scarce.

YOUTH MOVE FOOD FORWARD

© FAO/ANIS MILI
BEJA, TUNISIA, YOUNG AGRI-ENTREPRENEUR SABRINE BELHOUANE INSPECTS A LAMB.

01 INTRODUCTION

© FAO/GAVIN GOSBERT AND JE
IN ZANZIBAR, UNITED REPUBLIC OF TANZANIA, LYDIA THOBIAS CARRIES WATER TO HER FARM, AN ESSENTIAL PART OF SUSTAINING HER CASSAVA CROPS AND ENSURING A RELIABLE FOOD SOURCE FOR HER HOUSEHOLD AND COMMUNITY.

BACKGROUND

Youth are at the centre of key changes shaping the world. With approximately 1.3 billion individuals aged 15–24[1] making up 15.9 percent of the global population, today's youth cohort is the largest in history.[2] Nearly 85 percent reside in lower income countries, particularly in Asia and sub-Saharan Africa, where their numbers continue to rise.[2] This demographic shift presents both opportunities and challenges. If adequately nourished, educated and engaged in productive activities, young people have the potential to drive economic transformation and global prosperity. However, without meaningful opportunities, their potential could remain untapped, deepening vulnerabilities and social inequalities.

Youth are also growing up in an era of profound global disruptions. Economic downturns, rapid technological shifts and structural barriers continue to exacerbate employment challenges, with youth joblessness rates 3.5 times higher than those of adults.[3] Over 25 percent of the world's youth are not in employment, education or training (NEET).[3] Climate change is intensifying natural disasters, threatening livelihoods and agrifood systems that are already struggling to meet rising demands for nutritious and healthy diets in a sustainable manner.[4–6] These overlapping challenges profoundly shape the economic, social and political realities of today's youth, influencing their transition to adulthood and long-term well-being.

Despite these challenges, young people remain essential drivers of change. By their sheer numbers, youth consumption patterns, advocacy and labour will critically shape poverty reduction, job creation and food security outcomes.[7] Even in regions with smaller youth populations, their energy and innovation are crucial for sustaining local economies and the social fabric of rural communities.[8] In the absence of youth, labour shortages, a slowdown in agricultural and entrepreneurial activities, and weakened intergenerational knowledge transfer could hinder the transformation of agrifood systems.

> **"TODAY'S YOUTH COHORT CAN DRIVE ECONOMIC TRANSFORMATION IF ADEQUATELY SUPPORTED.**

Agrifood systems hold immense potential to boost youth livelihoods and drive rural economic transformation.[9–11] However, youth face significant challenges in transitioning to decent employment and sustainable livelihoods in agrifood systems. These challenges are particularly severe in lower-income countries, where rural and structural transformation have been slow and uneven, as well as distinct from the historical experiences of higher-come countries. In these contexts, the persistence of low-productivity, labour-intensive agriculture, coupled with resource access constraints, often limits youth opportunities, restricting them to low-paid and precarious jobs in agrifood systems.[12] Yet, even in advanced economies with strong labour protections, agrifood job opportunities for youth remain low-paying, seasonal and vulnerable. Young entrepreneurs face additional barriers, including high prices for land and startup costs, as well as strict sustainability regulations.[13, 14] These constraints are especially critical for rural youth, who compared to their urban counterparts are disproportionately affected by vulnerable employment,[12] lower literacy rates[15] and lower returns to education,[7] which hinder their successful transition into adulthood.

Recognizing these challenges, the 2030 Agenda for Sustainable Development[16] underscores the importance of young people as a crucial driver of inclusive economic growth, poverty reduction and food security. However, effective policymaking to fully harness the synergies between agrifood systems and youth is hindered by a lack of robust empirical evidence on youth engagement, contributions and challenges within agrifood systems. This includes gaps in understanding youth's productive engagement subsequent to the COVID-19 pandemic and how evolving demographic, socioeconomic shifts and environmental stresses may shape youth livelihoods in agrifood systems.

The Status of Youth in Agrifood Systems report provides a comprehensive evidence-based assessment of the dynamics of youth engagement on a global scale. It examines not only how enhancing decent jobs and food security outcomes for youth can be achieved through transformed agrifood systems, but also how empowered youth can act as catalysts for broader agrifood systems transformation. Simply put, youth need agrifood systems and agrifood systems need youth.

The report builds on the 2019 Rural Development Report[7] of the International Fund for Agricultural Development (IFAD) as well as existing state-of-the-art research and offers new insights into critical aspects of youth and agrifood systems. The report examines the status of youth in agrifood systems focusing on their ability to secure both decent jobs and food security and nutrition. The resilience of youth in the face of various shocks, their adaptive strategies and their potential contributions to mitigating these shocks to promote a resilient and inclusive agrifood systems are also explored. Furthermore, the report investigates how decent and productive youth engagement in agrifood systems and food security outcomes intertwine with human mobility, climate change and economic shocks. It also brings to light the significant role of intersectional factors such as gender and socioeconomic status in determining these outcomes and identifying the enabling factors and challenges that different types of youth face in accessing opportunities in agrifood systems. Finally, the report provides an extensive review of interventions and policies, assessing which have worked and why, and makes specific recommendations concerning the way forward.

© FAO/MARIO ARAUJO IN CASERÍO LA PEÑA, EL SALVADOR, A COMMUNITY PROMOTER CHECKS THE RESULTS OF SOIL MANAGEMENT

YOUTH-INCLUSIVE AGRIFOOD SYSTEMS: LEVERAGING SYNERGIES BETWEEN YOUTH AND AGRIFOOD SYSTEMS

AGRIFOOD SYSTEMS OFFER OPPORTUNITIES FOR YOUTH

Agrifood systems encompass a network of actors and interlinked activities involved in agricultural production, processing, distribution and consumption (Figure 1.1), that delivers over 11 billion tons of food each year. Agrifood systems employ approximately 1.23 billion people or one-third of the global workforce;[17] however, the number of people living in households connected to agrifood systems livelihoods is over three times that figure, reaching approximately 3.83 billion.[17,18] Employment in this sector is particularly crucial in lower-income countries, which account for over 60 percent of agrifood systems jobs.[17] Even in high-income countries where agrifood systems employment shares have declined, due to structural transformation, agrifood systems still represent about 11 percent of total employment.[17]

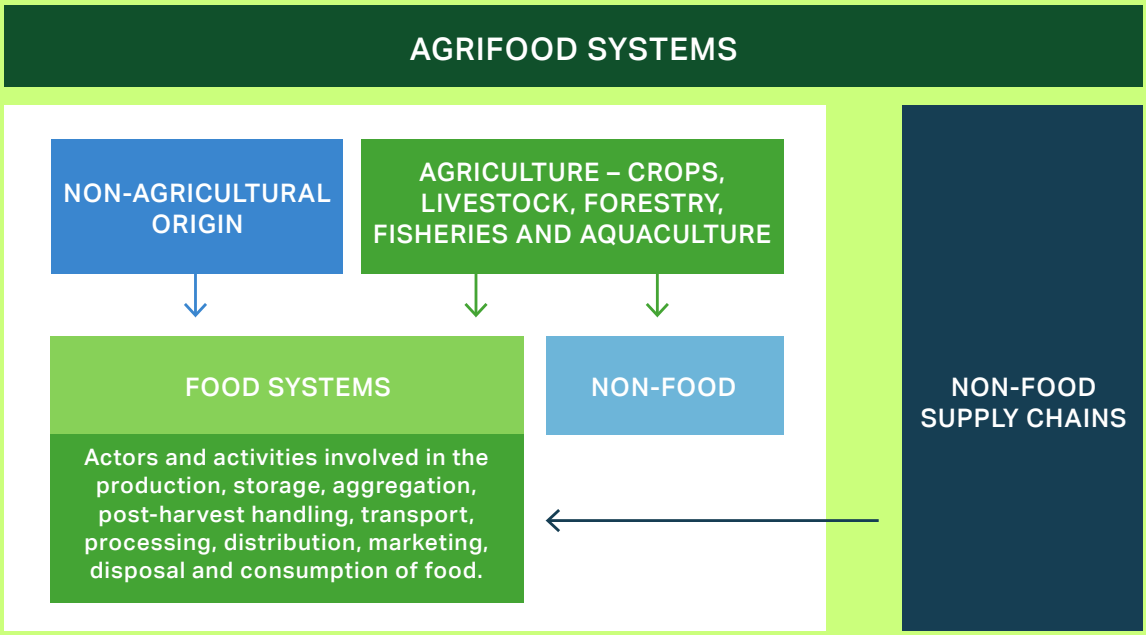
Access to different segments of agrifood systems varies for youth. Capital-intensive sectors like transportation and food processing require substantial investment, making entry difficult for young people with limited financial resources. In contrast, lower-cost segments such as small-scale trading and retailing have fewer barriers, providing more accessible opportunities for youth to engage in agrifood systems.

Agrifood systems represent a significant opportunity to address both employment and food security challenges facing rural youth in the present and future. As global population growth, urbanization and rising incomes drive demand for diverse and high value-added agricultural products, agrifood systems are poised for expansion.[19] Projections across five plausible scenarios indicate that global food demand is expected to increase between 35 percent and 56 percent between 2010 and 2050, particularly in low- and middle-income countries (LMICs) where populations are growing rapidly.[5]

In lower-income countries with large young populations, a large majority of youth depend on agriculture and related activities (Chapter 4). In these countries, many rural youth engage in agricultural production through small-scale farming,[20, 21] which is essential for their employment and food security. In less dynamic rural areas in particular, agriculture is seen as vital for young people's future aspirations.[20] In these contexts, agrifood systems remain the largest employer of rural youth, a phenomenon that is likely to persist.[11, 22] In middle- and high-income countries, the food service sector within agrifood systems functions as a significant source of jobs for youth.[22] Work in agrifood systems often serves as a stepping-stone, providing young people with initial work experience, skills and capital before transitioning to other sectors. Hence, enhancing the productivity and profitability of agrifood systems is vital for improving youth livelihoods both inside and out of agrifood systems and for fostering inclusive economic growth.

FIGURE 1.1

AGRIFOOD SYSTEMS ARE COMPLEX AND DYNAMIC AND INVOLVE A NETWORK OF ACTORS AND INTERLINKED ACTIVITIES



Source: FAO. 2023. *The status of women in agrifood systems*. Rome. https://doi.org/10.4060/cc5343en

To unlock the potential of agrifood systems for youth employment and broader poverty reduction and food security, it is essential to address the economic, social, environmental and institutional challenges that hinder their efficiency and sustainability. Jobs in agrifood systems are often characterized by low wages, informality, seasonal instability, lack of social protection, and poor health and safety standards.[12, 23, 24] Globally, one-third of informal economy labourers work in agriculture, rising to 62 percent in low-income countries.[25] The situation is particularly acute in rural areas, exacerbated by inadequate infrastructure and weak labour law compliance. Agrifood systems are also highly susceptible to environmental degradation and climate change, with significant associated threats including increased

> **ENHANCING THE PRODUCTIVITY AND JOB QUALITY IN AGRIFOOD SYSTEMS IS VITAL FOR IMPROVING YOUTH LIVELIHOODS.**

water scarcity, pest and disease outbreaks, saltwater intrusion, droughts, floods and extreme temperature events. Combined, low profitability and unfavourable working conditions contribute to negative perceptions of agrifood systems, making it difficult to attract and retain young workers.

For youth, such social, economic and environmental factors afflicting agrifood systems present both challenges and uncertainties, as the opportunities available to them will differ significantly from those available to previous generations. In some cases, migration may become a necessary adaptation strategy, as fewer agrifood systems-related activities remain viable. However, youth mobility is increasingly constrained not only by anti-migration sentiments towards international migrants but also by concerns about overcrowding, limited employment and inadequate housing in urban centres for internal migrants (Chapter 2).[26, 27]

YOUTH ARE KEY TO THRIVING AND SUSTAINABLE AGRIFOOD SYSTEMS

Young people represent the next generation of producers, processors, service providers and consumers in agrifood systems. Their actions and choices will determine the nature of agrifood systems transformation. Youth involvement is particularly vital in regions facing challenges such as an aging workforce and ongoing labour shortages.[8, 28]

Young people can be crucial drivers of change and adoption of innovation within agrifood systems, which are under growing ecological stress. Young individuals have a longer time horizon and are less constrained by past experiences, making them more open to experimenting with novel approaches that may yield long-term benefits.[29] Youth are also well-positioned to drive the development and widespread adoption of digital innovations that ensures a sustainable future for agrifood systems.

© FAO/SAIKAT MOJUMDER IN SUNAMGANJ, BANGLADESH, MOHAMAYA BAGCHI, THE PRESIDENT OF A COMMUNITY-BASED FISH FARMING ORGANIZATION IS HOLDING FISH HARVESTE FROM THE FIELD.

As consumers, today's youth represent a significant present and future market for agricultural products and services, making them essential to the transformation towards sustainable agrifood systems. Their large numbers and purchasing power allow young people to shape consumption patterns and drive demand for agrifood systems' goods and services.[30] With the right support, including education, exposure and incentives, young people can develop strong values and preferences favouring sustainably produced agrifood products, creating demand for ethical and environmentally friendly products.[7]

Transforming agrifood systems sustainably is a shared intergenerational responsibility. Actively engaging youth in these systems facilitates the intergenerational transfer of assets, knowledge and technology, laying a foundation for long-term resilience and adaptation. As young people collaborate with both peers and elders to strengthen local agrifood systems, they develop a sense of ownership and agency, which not only bolsters their personal growth but also reinforces community bonds.[7, 31] Additionally, when youth have a personal stake in their future, they are more likely to become stewards of sustainable and resilient agrifood systems, fostering a culture of inclusivity and collective action essential for building communities that can navigate evolving challenges.[32] However, as highlighted in Spotlight 1.1, demographic, sociocultural, psychological, economic and institutional barriers can hinder a country's ability to attract and retain youth in agriculture and rural areas. When these constraints persist, generational renewal is compromised, threatening the long-term viability of agrifood systems and the rural communities they sustain.

Youth inclusion in agrifood systems is a fundamental aspect of "leaving no one behind". Historically, youth have often been excluded from policy dialogues, resulting in a disconnect between their needs and the policies that govern agrifood systems.[33] By actively engaging youth in agrifood systems, their right to participate in decisions that impact their lives and futures is upheld, ensuring they are not overlooked in the quest for sustainable development.

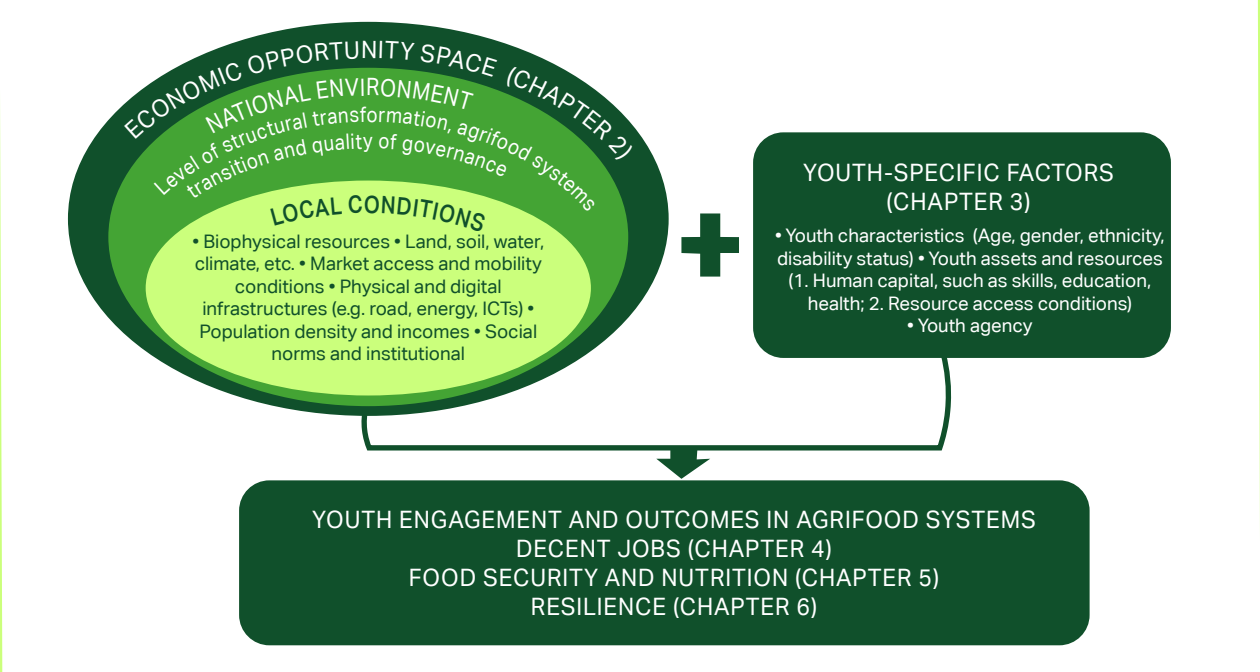
CONCEPTUAL FRAMEWORK

The ability of young people to participate in and effectively contribute to transformed agrifood systems that are inclusive of youth needs and aspirations is influenced by two primary factors: the economic opportunity space and youth-specific characteristics.[1, 2] Rural youth engagement in agrifood systems is shaped not only by individual attributes and capacities but also by the broader opportunities present in their national and local environments. Indeed, many determinants of youth outcomes reflect systemic factors external to youth rather than youth-specific constraints.[1, 2] Consequently, improving youth engagement and outcomes in agrifood systems demands a twofold strategy: investing in the expansion of opportunity within their communities and empowering young people to effectively leverage these opportunities (Figure 1.2).

> **"YOUTH ENGAGEMENT IN AGRIFOOD SYSTEMS DEPENDS ON THEIR CAPACITIES AND OPPORTUNITIES AROUND THEM.**

FIGURE 1.2

YOUTH ENGAGEMENT AND OUTCOMES IN AGRIFOOD SYSTEMS DEPEND ON THE SET OF ECONOMIC OPPORTUNITIES THEIR ENVIRONMENT OFFERS AND YOUTH-SPECIFIC CHARACTERISTICS



Source: Author's own elaboration.

Historically, agrifood systems have contributed to feeding growing populations, reducing poverty and improving welfare, at the risk of negative health outcomes, environmental degradation and inequality.[23, 34] Current agrifood systems transitions have contributed to climate change, biodiversity loss and the marginalization of vulnerable groups.[23, 34] Hence, while this report organizes its analyses around countries' positions in the agrifood systems transition, it places greater emphasis on actions that need to be taken to move towards a youth-inclusive agrifood systems transformation. It also advances a normative vision for sustainable agrifood systems that balances sustainability, healthy diets and inclusion with the creation of decent livelihoods, aiming to achieve three key outcomes:

1. Expanded access to decent jobs and sustainable livelihoods in agrifood systems, ensuring young women and men can seize emerging opportunities (Chapter 4).

2. Improved food security and nutrition through increased productivity, innovation, and better access to and consumption of healthy foods (Chapter 5).

3. Stronger resilience of agrifood systems and youth to adapt to and withstand shocks such as climate change, economic disruptions and conflict (Chapter 6).

ECONOMIC OPPORTUNITY SPACE DEFINES THE RANGE OF ENGAGEMENT OPTIONS ACCESSIBLE TO YOUTH

The economic opportunity space for youth refers to the set of viable economic opportunities that young people can harness to improve their livelihood.[35] These opportunities have strong spatial dimensions, reflecting variations in the structure of agrifood systems and the degree of structural and rural transformation within the country and local areas where youth reside.[7]

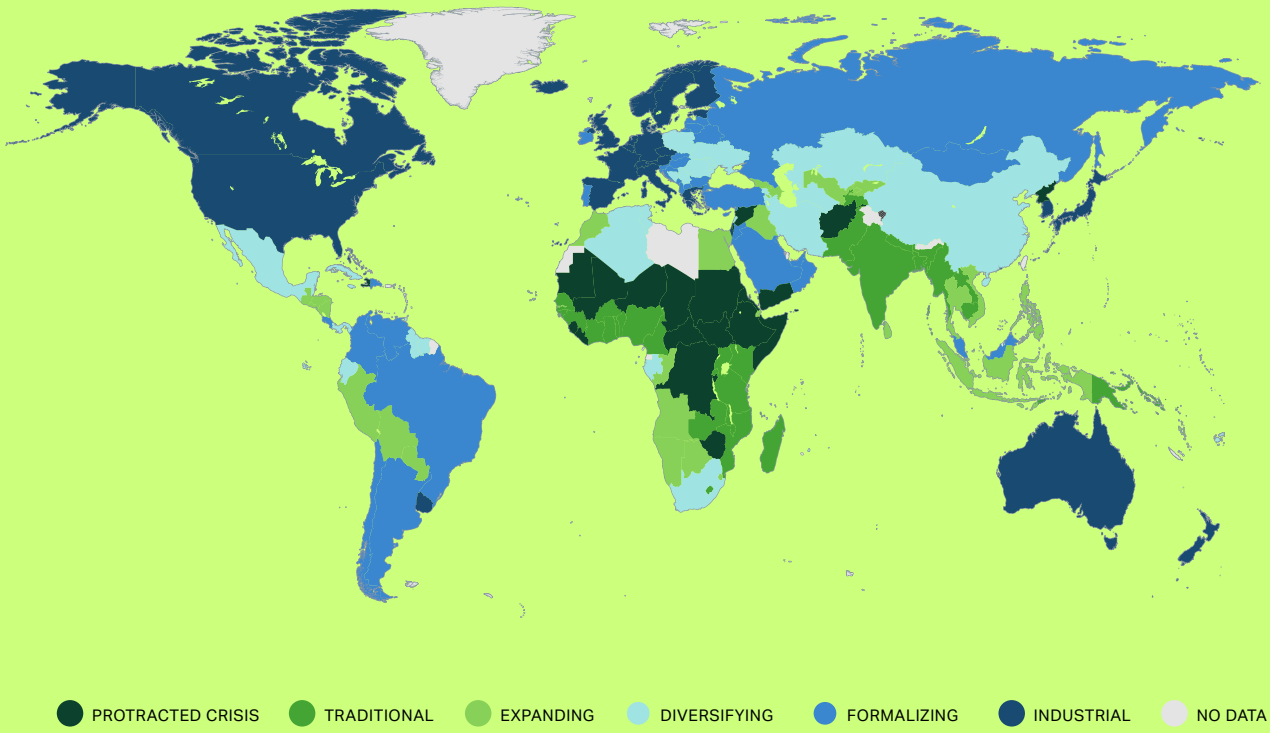
Agrifood systems are dynamic and continuously evolving, shaped partly by the interconnected processes of rural and structural transformation. Rural transformation, marked by changes in agricultural productivity, labour dynamics and infrastructure development, directly influences how food and agricultural products are produced, processed and distributed.[36, 37] At the same time, structural transformation, characterized by broader economic shifts such as industrialization, urbanization and changing employment patterns, alters the demand for agrifood products and services, further reshaping agrifood systems.[38, 39] Together, rural and structural transformation create feedback loops that affect agrifood systems transition, while technological advances, market expansion, policy reforms and demographic shifts add further layers of complexity,[38, 40] presenting both economic opportunities and challenges, including for youth. Hence, understanding a country's agrifood systems transition offers insights into the array of opportunities and challenges it may offer its young residents.

Within national boundaries, however, opportunities may vary across regions, influenced by the biophysical and socioeconomic context.[7, 41] In resource-based sectors like crop and livestock production, agroecological conditions (including soil type, climate and altitude) determine what can be produced, while marketability depends on factors like proximity to markets, population density and rural infrastructure.[7, 42] These factors create localized "economic opportunity spaces" that shape opportunities and constraints for rural youth, subject to the country's overall economic development.[41] That is, even in countries where agrifood systems transition is limited, favourable local agroecological conditions and strong market access can still generate opportunities for youth.[43] Hence, the report examines youth opportunities, engagement and outcomes in agrifood systems at the national level, shaped by the extent of agrifood systems transition and, where data permits, at the subnational level, determined by agricultural potential and market access conditions (see Chapter 2).

This report relies on the agrifood systems typology developed for the State of Food and Agriculture 2024,[44] which is based on Marshall *et al.*,[38] to gauge the status of agrifood systems transition and the implications for youth economic prospects. The typology uses measures of productivity, dietary diversity, urbanization and modern retail infrastructure coverage to assess the degree of agrifood systems transition, classifying countries into six categories highlighting relative variations in structure, practices and levels of market integration: Protracted Crisis, Traditional, Expanding, Diversifying, Formalizing and Industrial.[44] These six agrifood systems categories do not imply a unidirectional progression from a "less desired" traditional state to a "fully desired" industrial state; rather, it helps establish where countries are located in their agrifood systems transition, each facing unique opportunities and challenges related to productivity, inclusivity, sustainability and resilience[34, 38] (see Box 1.1 on the trade-offs associated with agrifood systems transition). Covering 171 countries and territories and representing 99 percent of the world's population in 2020 (see Figure 1.3 for a global map), the typology provides a framework for analysing the opportunities and constraints that rural youth face under different agrifood systems contexts.

FIGURE 1.3

AGRIFOOD SYSTEMS TYPOLOGY ALLOWS FOR CROSS-COUNTRY COMPARISON



Notes: Refer to the disclaimer on on page ii for the names and boundaries used in this map. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

Source: Adapted from FAO. 2024. *The State of Food and Agriculture 2024 – Value-driven transformation of agrifood systems*. Rome. https://doi.org/10.4060/cd2616en

Within agrifood systems, the quality of institutions and governance structures influence youth economic opportunities. Institutions establish the rules, norms and enforcement mechanisms that govern resource access, economic participation and the distribution of benefits within agrifood systems.[1, 2] Through their influence on market access, trade policies and infrastructure development such as roads and storage facilities, institutions determine the overall functioning of agrifood systems. Regulatory frameworks play a pivotal role in defining whether youth can secure essential resources like land, credit and agricultural inputs. Meanwhile, local governance structures, such as inheritance laws and land tenure regimes, as well as social norms, similarly influence how resources are managed within communities and, consequently, youth engagement in agrifood systems.[45, 46] Weak enforcement of labour regulations, for instance, can lead to exploitative practices like child labour or substandard wages for young workers. Conversely, robust enforcement of minimum wage laws, workplace safety standards and anti-discrimination policies ensures that youth have access to decent work and fair employment conditions in the agrifood sector.[3]

YOUTH-SPECIFIC FACTORS ENABLE OR INHIBIT YOUTH FROM CAPITALIZING ON AGRIFOOD SYSTEMS OPPORTUNITIES

Youth-specific factors encompass unique characteristics, constraints or opportunities disproportionately affecting young people during this transitional life stage.[47, 7] Youth represents a dynamic, formative phase between childhood and adulthood, marked by critical life transitions, including completing education, building assets, entering the workforce and establishing families. While some aspects of the transition to adulthood are tied to biological age, others are influenced by social constructs such as socioeconomic status, gender, education, independence and employment situation.[47, 7] Youth-specific factors include demographic characteristics (e.g. gender, ethnicity and disability status), skill levels, agency, and access to productive resources and assets (e.g. land, finance or technology). The intersection of these characteristics forms overlapping identities, shaped by sociocultural norms and generational power dynamics, which significantly shape young people's capacity to seize economic opportunities in agrifood systems (see Chapter 3).

Youth agency and young people's ability to translate this agency into social capital plays a large role in determining the ability to capitalize on opportunities afforded by their environment and agrifood systems. Agency allows young people to participate actively and engage civically in the world around them, improving the status and situation of themselves and others. It is also an important determinant of empowerment.[48] Gaining agency includes acquiring knowledge, skills (e.g. critical awareness, problem solving and communication) and capabilities to envision valued goals or futures and to pursue them by making free and informed decisions.[49] Youth agency and aspirations may often clash with the everyday reality of the social and economic environment and this misalignment may have an influence on youth's ability to fully harness agrifood systems opportunities[50] (see Box 1.2).

© FAO/ALISA SUWANRUMPHA IN SAKON NAKHON PROVINCE, THAILAND, A WOMAN WORKING IN THE AGRIFOOD SECTOR OBSERVES THE VACUUM PACKING OF GERMINATED HANG RICE AT A COMMUNITY ENTERPRISE.

BOX 1.1 TRADE-OFFS IN AGRIFOOD SYSTEMS TRANSITIONS

The agrifood systems typology comprises six categories,[i, ii] reflecting a transition from traditional to more formalized and industrialized systems. This progression is not strictly linear and does not seek to suggest that industrialized systems are most desirable. The categories also do not equate agrifood system transformation with a normative vision balancing sustainability, healthy diets, inclusion and decent livelihoods. Instead, each category presents distinct opportunities and challenges concerning environmental sustainability, nutrition and inclusion.

Protracted crisis and *traditional agrifood systems* represent the early stages of agrifood systems transition. They are dominated by small-scale and subsistence farming, reliance on local inputs and minimal market integration. While these systems may have better preserved local knowledge, biodiversity and cultural heritage, they face persistent challenges related to market access, low technological investment, and widespread poverty and malnutrition, which constrain opportunities for youth.[i] In protracted crisis contexts, prolonged conflicts, economic instability and environmental shocks further disrupt food production and livelihoods, making it even harder for young people to secure sustainable opportunities.[ii, iii]

Expanding, *diversifying* and *formalizing agrifood systems* encompass the three key intermediate stages of agrifood systems transition, each marking a shift towards greater productivity, market integration and structural transformation.

Expanding agrifood systems are characterized by the adoption of improved technologies and scaled-up production, boosting yields and incomes. These systems increasingly stimulate off-farm employment in processing, logistics and input supply, creating new economic opportunities for youth. However, barriers such as limited access to capital, land and technology can exclude youth, while unchecked intensification may degrade natural resources.[i, ii]

Diversifying agrifood systems blend traditional and modern agricultural practices, broadening the production and encouraging the growth of non-farm rural enterprises. This diversity helps to mitigate risks associated with market and climate shocks while providing rural households, including youth, with alternative income streams. However, unequal access to resources and markets can disadvantage marginalized youth, as diversification often favours those with better capital and connections.[i, ii]

Formalizing agrifood systems feature the development of more structured and regulated agrifood markets, marked by improved quality standards, labour protections and more stable supply chains. These systems can increase returns for agrifood system actors, including youth, by ensuring better land tenure security, enforcing fair labour practices and creating more predictable market conditions. However, if policy enforcement is uneven or overly restrictive, formalization may marginalize small-scale producers and businesses, making it harder for young, resource-constrained entrepreneurs to compete in increasingly consolidated markets. Without the necessary skills or access to capital, youth may find it difficult to transition into formal employment or establish enterprises within these systems.[i, ii]

Notes: Refer to the **Notes section** for full citations.

BOX 1.2 YOUTH AGENCY

Agency, the ability to define one's goals and act upon them,[i] is a critical factor in enabling young people to participate effectively in transforming agrifood systems, to reflect their needs and aspirations. When youth have greater agency, they are better equipped to make informed decisions, identify opportunities and optimize the resources, skills and assets available to them. Agency exists on spectrum, ranging from a limited ability to make choices in restrictive environments, to conditions in which actors have greater autonomy and the freedom to make decisions within a more supportive context.[ii] Youth agency is socially embedded and constructed, and is profoundly influenced by the broader sociocultural, economic, institutional and political environment where youth live.

Youth agency and engagement with agrifood systems can be analysed through generational, life course and intersectional perspectives,[ii] each of which offers unique insights into how young people navigate their roles, exert their agency and respond to structural constraints. The generational perspective views youth as a distinct social group with a shared identity shaped by the time and place in which they grow up. Being part of a younger generation can create both challenges and opportunities, as relationships with older generations often involve power dynamics.[ii] Older generations typically hold more power and influence, while youth people may struggle to have their voices heard and contributions valued.[iii] The life course perspective recognizes youth as a transitional phase between childhood and adulthood, during which young people take on new responsibilities in areas like food production, employment and nutrition. These transitions are influenced by cultural norms, economic opportunities and structural barriers, with some youth experiencing prolonged dependency due to limited job prospects or educational barriers.[iv] The intersectional perspective emphasizes how youth experiences are shaped by multiple overlapping social factors such as gender, class, ethnicity and disability. These factors create different challenges and opportunities with the result that not all youth experience agrifood systems in the same way.

The concept of the "intergenerational contract" explores how family relationships shape youth agency. The idea refers to both explicit and implicit expectations that family members have towards one another, balancing dependence, interdependence and autonomy.[v] In rural Bangladesh, for example, youth navigate familial networks where their aspirations align with and sometimes diverge from those of their family members. Their agency is not exercised in isolation but is profoundly influenced by familial obligations and economic realities.[vi]

Youth agency is dynamic and evolves along the process of personal growth, with the individual becoming more capable of renegotiating their agency space as they gain more education, experience, exposure and independence, acting and interacting within their own environment.[ii] The relationship between agency and aspirations is thus reciprocal: as young people develop a stronger sense of agency, they gain new skills and knowledge, build greater confidence and, as a result, set higher goals and strive for more in their lives. Additionally, for some young people, agency is enhanced through pathways such as migration, education or employment, which open up opportunities to build new relationships and expand their social networks over time.[vii]

As such, youth agency is inherently complex both to define and measure.[viii] Young people's aspirations often intersect and at times clash with the socioeconomic realities of their environments, a misalignment that may have an influence on youth's ability to effectively dictate the course of their life.[iii] For instance, a study on youth in Indonesia[ix] demonstrated that the mismatch between youth education qualifications and employment opportunities in the formal sector affects youth's sense of agency and their ability to shape their future.

Notes: Refer to the **Notes section** for full citations.

To account for the diverse and overlapping identities of youth, the analytical framework of this report incorporates an intersectionality lens to examine engagement in agrifood systems. For the purposes of statistical comparison, the report adopts the United Nations definition of youth as individuals aged 15–24 years; however, in the interest of policy relevance, it also examines how youth compare with young adults (25–34 years) and adults (35 years or more). Where data allow, the youth category is further disaggregated into younger youth (15–17 years or 15–19 years, depending on data availability) and older youth (18–24 years), and additional intersecting variables (e.g. gender, socioeconomic status and geographic location) are used to explore how these factors shape youth experiences. Table 1.1 presents definitions of the different age cohorts examined in the report. A strong gender lens is applied throughout, incorporating sex-disaggregated data and acknowledging the distinct social norms that influence the risks and opportunities faced by young women and men. Finally, the report pays special attention to vulnerable groups such as Indigenous Youth, migrant youth, youth from low-income households and youth with disabilities.

TABLE 1.1 DEFINITIONS OF YOUTH ADOPTED IN THE REPORT

AGE	0–17			18+	
	0–14	15–24		25+	
	0–14	15–17	18-24	25-34	35+
UN CONVENTION LEGAL DEFINITION BASED ON AGE	CHILD		ADULT (LEGAL AGE OF MAJORITY)		
TERMINOLOGIES IN THE REPORT	CHILD	YOUTH		ADULT	
	CHILD	YOUNGER YOUTH	OLDER YOUTH	YOUNGER ADULT	OLDER ADULT

Source: Author's own elaboration.

STRUCTURE OF THE REPORT

This report consists of seven chapters, structured into three parts, which examine key dimensions of youth engagement in agrifood systems. Together, they provide a comprehensive picture of the demographic, socioeconomic and environmental factors shaping youth participation and outcomes from agrifood systems, as well as opportunities, challenges and policy pathways towards transformed agrifood systems that deliver decent jobs, food security and nutrition, and resilience.

Part I (Chapters 2 and 3) lays the foundation for understanding youth engagement and outcomes in

agrifood systems across diverse contexts by examining available opportunities and young people's ability to leverage them. Chapter 2 focuses on youth economic opportunities in agrifood systems. It explores how youth demographics and mobility patterns intersect with agrifood systems and sub-national biophysical resource and market access to determine youth opportunities. Chapter 3 examines factors that enable or inhibit youth from seizing these opportunities, focusing on assets and resources youth need, such as human, natural, financial, physical and social capital, and how generational, gendered and social inequalities affect access.

Part II (Chapters 4, 5 and 6) evaluates key youth outcomes essential for agrifood systems transformation. Chapter 4 analyses youth employment in agrifood systems, exploring the types and quantities of jobs young men and women hold and the conditions under which they work. It assesses intergenerational and sectoral mobility, following labour shifts from primary agriculture to higher productivity sectors and their impacts on youth welfare. Chapter 5 focuses on food security and nutrition, assessing youth's unique dietary needs, prevalence of food insecurity, and the effect of inadequate diets and malnutrition on youth's health, productivity and agrifood systems engagement. Chapter 6 explores youth resilience to economic disruptions, climate change and conflicts. It examines how shocks and crises shape opportunities in agrifood systems and how young people cope, adapt and contribute to mitigating their effects on themselves, their communities and broader agrifood systems.

Part III concludes the report by examining policies and strategies that support youth-inclusive agrifood systems transformation. Chapter 7 reviews youth-focused interventions and programmes to identify approaches and design features that effectively expand youth's economic prospects in agrifood systems and enable young people to engage meaningfully in agrifood systems. It highlights strategies for improving outcomes in decent jobs, food security and nutrition, and resilience to shocks, alongside measures that strengthen youth voice and agency, skills development and access to essential resources. By detailing key design elements and presenting best practices, Chapter 7 offers policymakers, practitioners and stakeholders clear guidance on how to foster a supportive environment for youth and ensure that they become pivotal actors in agrifood systems transformation.

©FAO/PETER SAFARI IN KITUI, KENYA, BONIFACE MWINI COLLECTS DATA AT MIAMBANI WARD WHILE WORKING WITH LOCAL FARMERS TO WEIGH AND RECORD LIVESTOCK FEED INPUTS. THE ACTIVITY IS PART OF A COMMUNITY-BASED INITIATIVE TO IMPROVE SMALLHOLDER PRODUCTIVITY AND STRENGTHEN DATA-DRIVEN DECISION-MAKING IN AGRICULTURAL PRACTICES.

SPOTLIGHT 1.1 GENERATIONAL RENEWAL IN AGRICULTURE: CHALLENGES AND OPPORTUNITIES FOR DECLINING YOUTH POPULATIONS

As a result of structural transformation and demographic transitions, most high- and many middle-income countries face the dual challenges of an aging and declining rural population.[i] In Europe, for example, 58 percent of farm managers were over the age of 55, while only 12 percent were less than 40 years old in 2020[ii] Similarly, in Thailand, the share of farm managers over the age of 65 rose from 17 percent in 2016 to 25 percent in 2022, while those under the age of 45 declined from 29 percent to 18 percent over the same period.[iii] The lack of generational renewal in agriculture poses a serious threat to the future viability of agrifood systems in many countries and the rural communities they support.[iv–vi]

While demographic trends and broader changes in the structure of economies that occur as countries develop are key contributors to the aging of rural populations, they are not the only factors impeding generational renewal in rural areas. Evidence on the challenges inherent in attracting young people to rural places and agrifood systems work — and motivating them to remain – highlight a range of mediating factors including sociocultural, psychological, economic and institutional constraints.

Sociocultural constraints are an important barrier to attracting and maintaining youth in agriculture and rural spaces. Multiple studies have shown that older farmers are reluctant to cede management control or decision-making to the next generation until they are no longer physically able to continue farming.[vii, viii] As a result, younger generations are not effectively integrated into critical farm management decisions and feel unable to contribute ideas and innovations.[ix] Various factors mediate older farmers' decisions regarding when to stop farming and what to do with the farm. There is also evidence that the ways in which older generations prepare possible successors have changed. In Norway, for example, farmers no longer work closely with their children on farm management activities to prepare them to take over the farm.[x] Instead, farmers prefer that their children dedicate more time to learning the skills and competencies necessary for modern society. This lack of effective coaching and mentorship of young people by older generations leaves potential young farmers less psychologically and practically prepared or willing to take over their parent's farms.[vi]

Research shows that youth perceptions of agricultural work affect their willingness to become farmers. Younger rural generations have higher levels of education than previous generations and a greater capacity to access non-farm employment (see Chapter 3).[iv, xi] This change has coincided with a growing perception of farming and

agriculture as a "dirty" profession, suited for uneducated and unskilled people.[v, xii–xiv] A study from India found that even young, progressive farmers who are economically well-off were perceived as having a lower social status – affecting their marriage prospects – compared with youth in low-paid, informal urban jobs.[xv] Parents, teachers and mentors can reinforce this perception, discouraging young people from considering farming as a viable career.[xv] Education plays a crucial role in shaping young people's identities, yet school systems frequently exhibit a bias against farming, promoting career aspirations that are often unattainable for most rural youth[xvi, xvii] (see Chapter 3). Changing perceptions of farm work, combined with increasing non-farm opportunities, act as an important physiological barrier to retaining young people in agriculture.

Economic concerns are also an important barrier to retaining and attracting young people to agricultural work. As economies grow, the earning gap between agriculture and non-agriculture work typically grows. Yet these gaps are often exacerbated by additional factors. First, non-farm employment typically offers more secure and predictable earnings, and higher levels of economic security, such as pensions and retirement accounts, unemployment benefits and health insurance.[iii, xviii, xix] In China, for example, pension payments for urban labours are significantly higher than those for rural people.[iv] Second, growing recognition of the adverse effects of climate change on agriculture is adding additional economic uncertainty to an already uncertain profession, making agriculture a less desirable profession for the younger generation. Evidence from Ghana and India shows that the risks posed by climate change demotivates young people from working in agriculture.[xx, xxi]

Access to and availability of land of sufficient size and quality to sustain a livelihood is a key challenge preventing youth from engaging in agriculture (see Chapter 3). The challenge of acquiring land is complex and multidimensional. Prices for land in many places, including in the European Union, the United States of America and some Asian countries, are high and often prohibitive for new entrants.[xxii–xxiv] High land prices and low land availability are exacerbated by a range of institutional and administrative factors that further constrain youth from engaging in agriculture. A key issue is that older generations often hold on to land and remain in farming due to a lack of adequate pension or retirement security.[xii, xx] A study from Thailand found that farmers who received rice subsidies were more likely to continue farming and to transfer their land within the family. Conversely, older farmers with access to pensions were more likely to exit farming and to transfer their land outside the family.[v] In many cases, no or meagre old-age social security (pensions) force aging farmers to continue farming or to lease out their land as a way to supplement their limited income rather than transfer it to family members.[xxvi, xxvii] Older farmers are also reluctant to exit farming or part with their land because they consider farming to be a way of life and not simply an occupation.[xxii] Moreover, because of the precarity of some off-farm employment, land is seen as an important source of livelihood security, incentivizing farmers to hold onto land even when these farms are small or unproductive.[xxviii] Finally, land transfers and sales can be administratively burdensome and costly. In Spain, for example, land succession processes have led to land fragmentation, increasing the transactions costs per land unit to acquire and cultivate land and contributing to high rates of land abandonment.[xxix] In some countries in Europe, land leasing policies seeking to protect tenants from losing control over their property have had the side effect of limiting the transfer of land from older to younger people.[vi]

Addressing the challenges of generational renewal in agriculture will require multidimensional policy approaches. These approaches must tackle the barriers hindering young people from entering the sector and the challenges older farmers face when deciding to retire. They must also create incentives that draw in new entrants and foster farm succession. The factors impeding generational renewal are not merely economic; they consist of interdependent interactions of economic, social, psychological and institutional factors, and often involve competing interests and trade-offs across generations.

Notes: Refer to the **Notes section** for full citations.

© FAO/SIRACHAI ARUNRUGSTICHAI
IN SATUN, THAILAND, A YOUNG URAK LAWOI COMPRESSOR DIVER GENTLY HANDLES A HIGHLY VENOMOUS REEF STONEFISH BEFORE RELEASING IT BACK TO THE SEAFLOOR DURING A FISHING TRIP IN THE ADANG-RAWI ARCHIPELAGO.

OPPORTUNITIES MOVE FOOD FORWARD

© FAO/LUIS TATO
YOUNG FARMERS VISITING A PIG FARM IN GATANGA, KENYA.

02
THE CHANGING LANDSCAPES OF YOUTH OPPORTUNITY

© FAO/MATEO ALFEREZ
A YOUNG COCOA FARMER IN CUBARÁ, COLOMBIA.

KEY MESSAGES

- Nearly 85 percent of the world's 1.3 billion youth live in lower-income countries, particularly in sub-Saharan Africa and Southern Asia, where their numbers continue to rise.
- Despite rapid urbanization, rural areas still accommodate 46 percent of the youth population. Inclusive rural transformation remains critical to improving youth welfare.
- Most rural youth live in regions with traditional and protracted crisis agrifood systems. Transforming these systems through inclusive productivity growth is crucial to improving their economic prospects.
- Countries with industrial agrifood systems, predominantly in Eastern Asia, Europe and Northern America, have lower shares of rural youth. These regions face labour shortages, necessitating strategies to attract and retain youth in the agrifood sector.
- Most rural youth live and work in areas with high agricultural productivity potential and moderate to high market access, offering varied opportunities for engagement in agrifood systems. However, 36 percent live and work in areas with strong agricultural productivity potential but weak market access, suggesting that in some contexts, improving infrastructure and market access may be more critical to enhancing youth livelihoods than boosting agricultural productivity alone.
- About 395 million rural youth live in areas facing climate change-induced declines in agricultural productivity potential. Climate resilience, social protection and migration options are pivotal to safeguarding their economic prospects.
- Youth are highly mobile, with higher rates of migration than adults, particularly within their own countries. Most youth migrants do not cross international borders. Nonetheless, international migration among youth aged 15 to 24 grew over the last decades from 22.1 million in 1990 to 31.7 million in 2020. Youth represent 16.2 percent of migrants in sub-Saharan Africa, and 15.2 percent in Latin America and the Caribbean.
- Youth migration is closely linked to other life transitions such as entering the workforce, pursuing higher education and marriage, with these transition patterns varying significantly by gender. Across all agrifood system types, female youth migrate internally at higher rates than their male peers, primarily for marriage and to join a family.
- Youth migration, particularly from rural to urban areas, is often temporary or seasonal, allowing youth to keep ties with rural areas, while exploring different livelihoods options.

INTRODUCTION

Youth engagement in agrifood systems and its outcomes are shaped by both the availability of opportunities and young people's ability to access and leverage them effectively (see the conceptual framework in Chapter 1). These opportunities vary across context and are influenced by an area's biophysical and socioeconomic conditions, the structure of agrifood systems and broader rural and structural transformation processes. Consequently, youth encounter a diverse set of challenges and possibilities related to participation in agrifood systems, depending on where they live. This chapter draws on data from multiple sources to map where young people live and examine the agrifood systems transitions that have taken place in these areas, in order to identify contextual opportunities for and constraints on youth engagement. It also discusses how the geographic distribution and migration patterns of youth influence labour availability for agrifood system transformation and explores the extent to which opportunities are susceptible to climate-induced shocks.

Youth are highly mobile, often moving within and across regions in search of better economic opportunities. This mobility enables them to access diverse opportunity spaces, including urban and international job markets, higher education institutions and environments that support emerging and growing agrifood enterprises.[1] Youth movement patterns can affect the redistribution of labour,[1, 2] knowledge and financial capital,[1] which in turn can have implications for the resilience and sustainability of agrifood systems. Remittances from young migrants abroad often support agribusiness initiatives in their origin communities, while returning migrants bring new ideas, skills and technologies that can boost agricultural productivity and innovation.[1] Youth migrants also play a crucial role in agrifood systems, especially in regions where the agriculture sector faces labour shortages.[3–6] Evidence shows that both rural-bound[7] and (peri-)urban-bound[8, 9] migration convey important welfare benefits. To fully capture youth opportunities, the chapter also investigates the extent of youth mobility across geographies, the characteristics of mobile youth, the factors driving their migration and the constraints they encounter. Through this analysis, the chapter lays the foundation for understanding youth realities across different contexts and highlights how patterns of residence and mobility shape youth economic prospects and agrifood systems outcomes.

MAPPING WHERE YOUTH LIVE

This section draws on analyses integrating population data with high-resolution geospatial datasets to map where youth live. It applies the Urban–Rural Catchment Area (URCA) framework,[10] which classifies rural and urban areas based on their travel time to urban centres and the population sizes of those centres. This approach enables cross-country comparability and offers a more nuanced view of market access and connectivity[10, 11] (see

Appendix 1 for details of the methodology). In addition, this section employs the agrifood systems typology (see Spotlight 1.1) and adapts the concept of *rural opportunity space* used in IFAD's *2019 Rural Development Report*[12] to highlight how countries' positions in terms of agrifood systems transition, together with local biophysical and socioeconomic conditions, shape contextual opportunities and challenges for youth engagement in agrifood systems.

DISTRIBUTION OF YOUTH POPULATION

Globally, an estimated 1.3 billion individuals are between the ages of 15 and 24 years, the largest youth cohort in human history. While their proportion as a share of the global population is projected to decline in the coming decades (Figure 2.1), their absolute numbers will continue to rise, reaching approximately 1.4 billion by the early 2030s.[13] However, youth demographic trajectories vary significantly across regions, reflecting differences in economic development, fertility rates and migration patterns. Two broad, divergent trajectories are evident. The first is found primarily in lower-income countries of regions such as sub-Saharan Africa and Southern Asia. Here, youth populations remain large and continue to grow due to high fertility rates and declining child mortality. Nearly 85 percent of the world's youth live in these lower-income countries.[13] Sub-Saharan Africa, in particular, has a higher-than-average share of youth among its population, and is expected to see a 65 percent increase, reaching around 400 million by 2050 (Figure 2.2).[13] Similarly, youth make up one in six people in regions such as Latin America and the Caribbean, North Africa, Southeast Asia, and Western and Central Asia. By the middle of the century, youth populations are expected to grow by 50 percent in Central Asia and 24 percent in North Africa.[13]

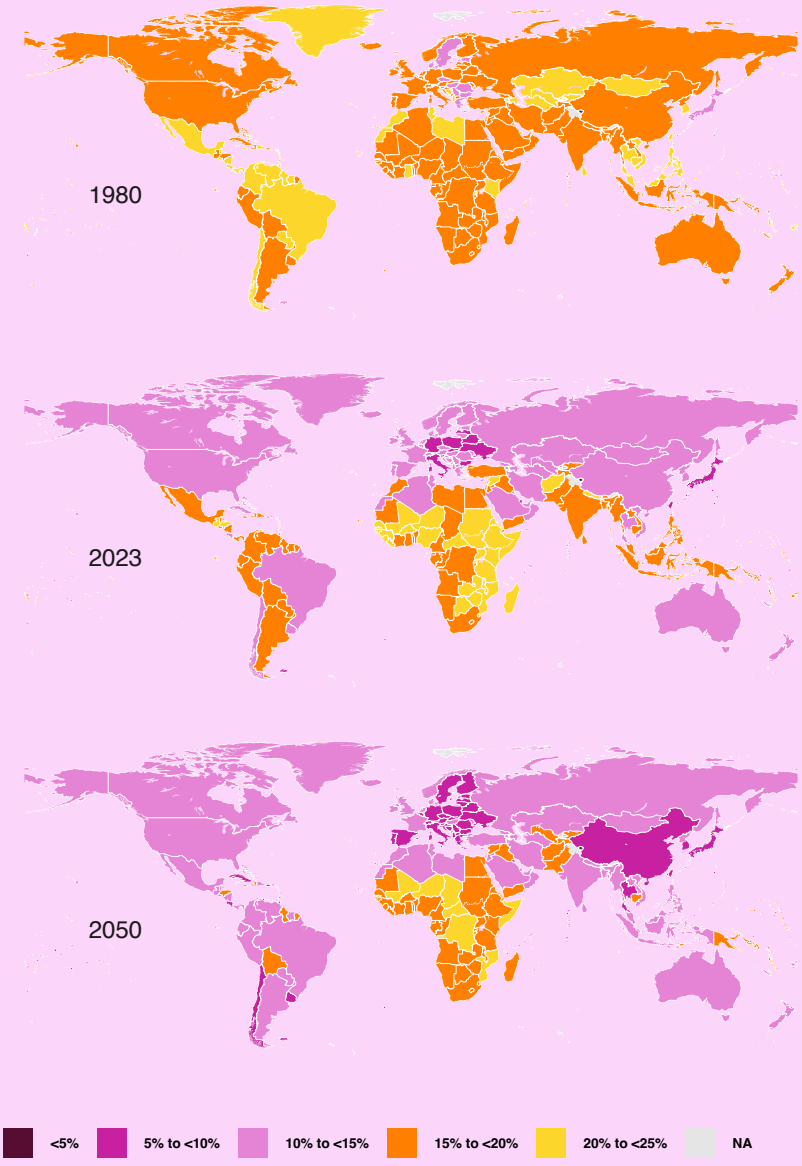
> **EIGHTY-FIVE PERCENT OF THE WORLD'S 1.3 BILLION YOUTH LIVE IN LOWER INCOME COUNTRIES.**

The second demographic trajectory is evident in high and upper middle-income countries, primarily in East Asia, Europe, Northern America and parts of Latin America, where youth populations are shrinking and make up a smaller share of the total population (about 10 percent or less). This decline is driven largely by persistently low fertility rates, which in some cases have fallen below replacement levels. In these regions, immigration is expected to become a key driver of future population growth.[14]

© FAO/EDUARDO SOTERAS IN KAPOETA, SOUTH SUDAN, A YOUNG FARMER COLLECTS VEGETABLES AT A FARM.

FIGURE 2.1

YOUTH SHARES IN POPULATIONS ARE DECLINING OVER TIME ALTHOUGH ABSOLUTE NUMBERS CONTINUE TO RISE

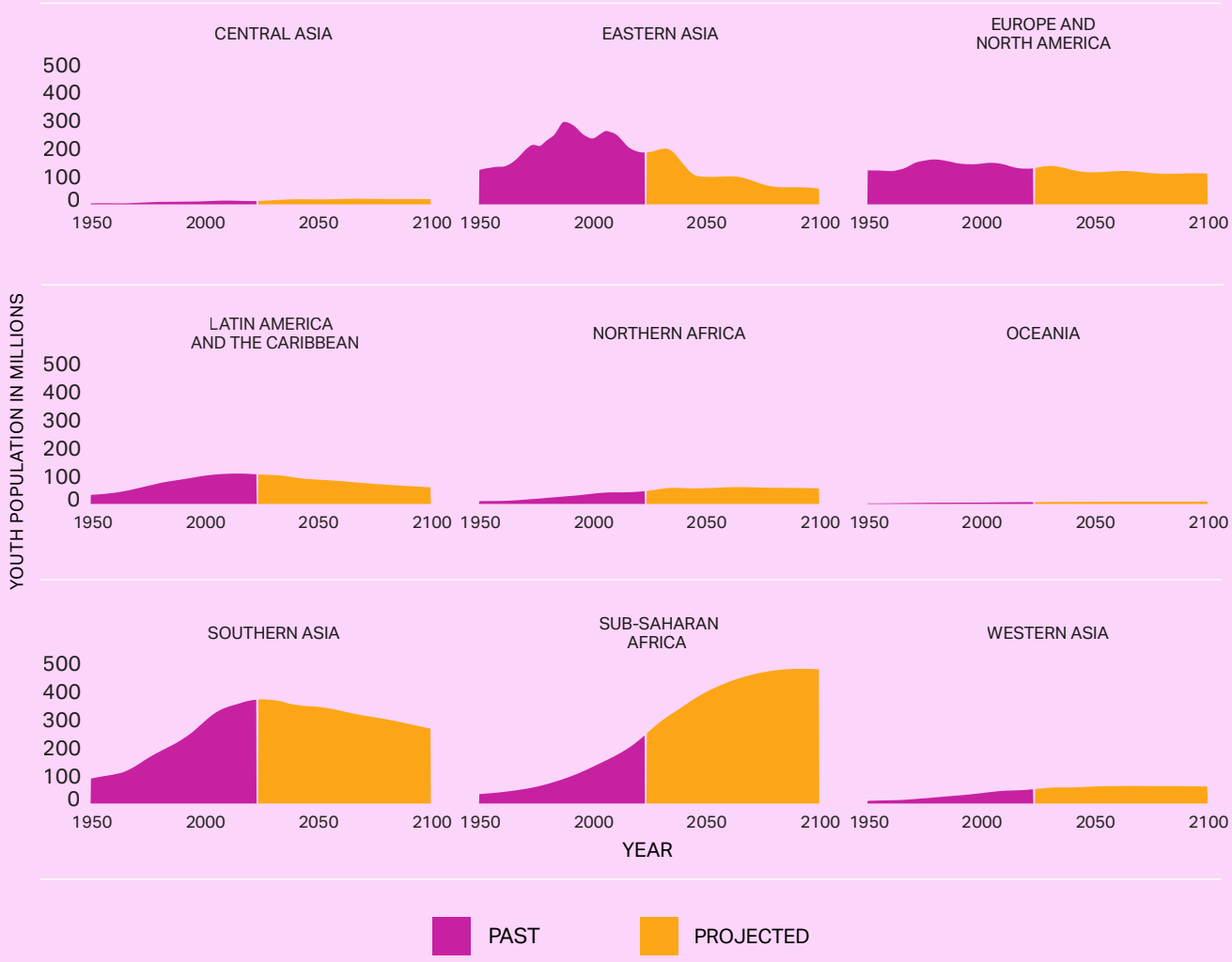


Notes: Refer to the disclaimer on page ii for the names and boundaries used in this map. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

Source: Author's own elaboration using population data from UNDESA. 2024. *World Population Prospects – Population Division – United Nations*. New York, NY. [Cited 1 January 2023]. https://population.un.org/wpp/downloads
National borders are based on United Nations Geospatial data. 2023. Map geodata [UN Geodata]. New York, USA, United Nations.

FIGURE 2.2

YOUTH POPULATION TRENDS VARY ACROSS REGIONS



Source: Author's own elaboration using population data from UNDESA. 2024. *World Population Prospects – Population Division – United Nations*. New York, NY. [Cited 1 January 2023]. https://population.un.org/wpp/downloads

RURAL-URBAN DISTRIBUTION OF YOUTH

Urban areas host 54 percent of the global youth population, reflecting rising urbanization trends worldwide (see Appendix 1 for a definition of urban and rural spaces).[15] This shift is driven by natural population increases, the expansion of small towns into urban areas, and rural-to-urban migration as young people seek better education and livelihoods, social mobility and cultural opportunities.[15, 16] The shares of youth residing in urban areas are highest in South-eastern Asia (67 percent), North Africa (62 percent), Western Asia (61 percent), Europe and Northern America (61 percent), and Latin America and the Caribbean (61 percent). This trend reflects advanced urbanization and contexts in which youth engagement in agrifood systems will likely be more closely tied to off-farm segments of agrifood systems, especially retailing, food processing and services within urban and peri-urban areas, rather than primary agriculture.

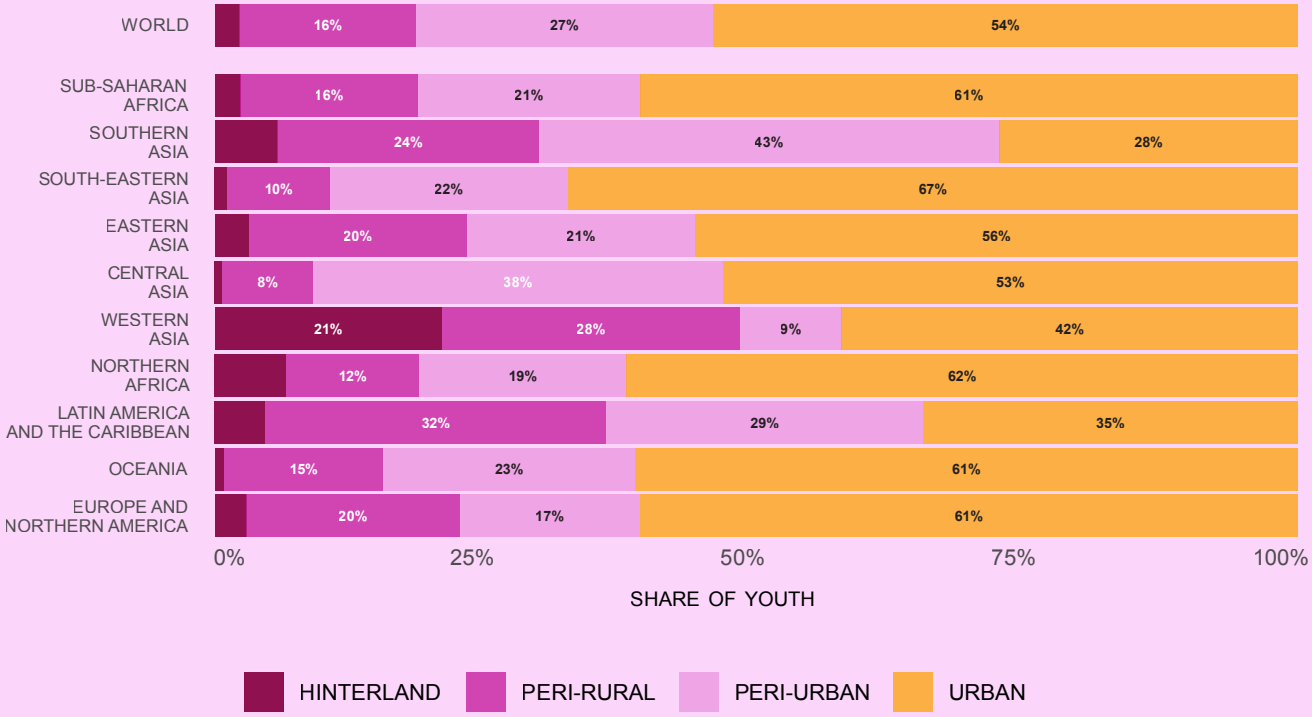
Despite rapid urbanization, rural areas (consisting of peri-urban, peri-rural and rural hinterlands) still accommodate 46 percent of the global youth population. Although the proportions of rural populations and rural youth are expected to decline over time, projections indicate that about a third of the global population will continue to live in rural areas by the middle of the century.[15] The allure of improved employment opportunities and services draws youth to urban centres, but a substantial share will likely stay and seek livelihood opportunities in rural areas due to factors such as family ties, cultural connections and opportunities in agriculture and entrepreneurship, and/or a variety of constraints that may limit mobility.[17, 18] Young people may migrate temporarily to urban and peri-urban areas for work, but they often return to rural areas.[19]

> **NEARLY HALF OF ALL YOUTH (46 PERCENT) STILL LIVE IN RURAL AREAS.**

More than half of rural youth (58.7 percent), representing about 27 percent of youth worldwide, are located in peri-urban areas, situated outside of city limits but within an hour's travel to urban centres. These zones often blend urban and rural life,[20] offering diverse economic activities, from agriculture to services and small industries.[21, 22] Peri-rural areas host the second largest share of rural youth (35.4 percent), followed by rural hinterlands (5.8 percent). These areas are home to about 16 percent and 5 percent of the global youth population, respectively (Figure 2.3). Youth in peri-rural areas benefit from proximity to rural resources and urban markets, although their access to the latter is more limited than their peri-urban peers.[23] Those in rural areas, and especially rural hinterlands, tend to maintain strong ties to their communities and traditional agricultural practices. This connection coupled with familiarity with local ecosystems positions them to innovate solutions that integrate traditional knowledge with modern technology in ways that are environmentally sustainable and socially acceptable.[24] As demand for sustainable and locally sourced food continues to grow, youth in peri-rural and rural hinterlands are well-placed to capitalize on emerging opportunities in niche markets, such as organic farming.[25, 26]

FIGURE 2.3

A SUBSTANTIAL SHARE OF YOUTH RESIDE IN RURAL AREAS DESPITE RAPID URBANIZATION



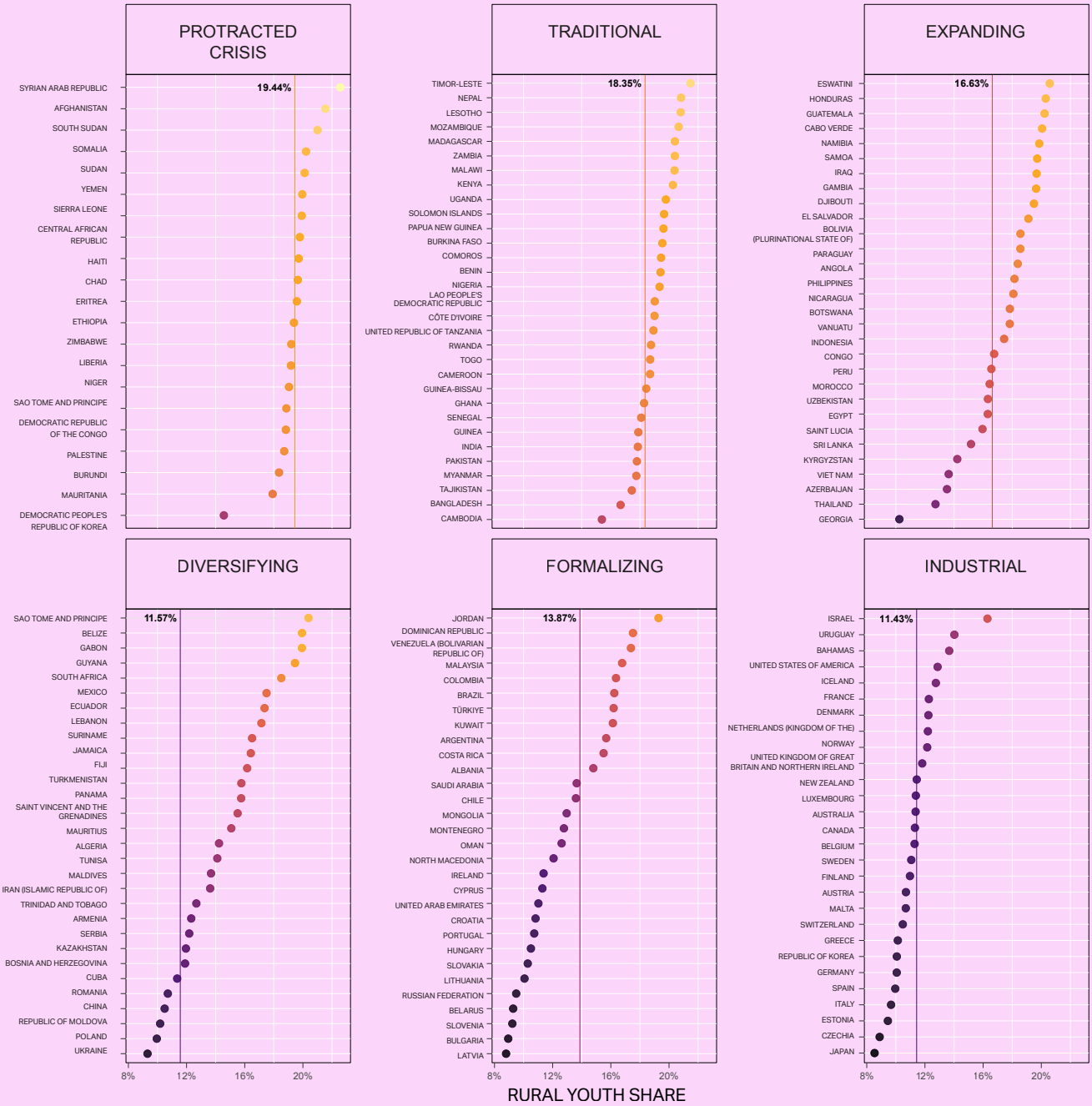
Source: Author's own elaboration based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton; the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project, funded by the Bill and Melinda Gates Foundation (OPP1134076) (https://dx.doi.org/10.5258/SOTON/WP00647); and Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare. Dataset (https://doi.org/10.6084/m9.figshare.12579572.v4).

RURAL YOUTH DISTRIBUTION ACROSS AGRIFOOD SYSTEM TYPES

Agrifood systems transition is closely intertwined with youth demographic shifts, which present both challenges and opportunities for the long-term viability and resilience of agrifood systems. As countries transition from traditional, labour-intensive agriculture towards more diversified and industrialized agrifood systems, the share of youth in rural populations (Figure 2.4) and of rural youth and children in total population (Figure 2.5) declines. In the early stages of agrifood systems transition, as exemplified by countries with traditional and protracted crisis agrifood systems, youth make up a higher share of the rural population. Rural youth, on average, account for 19.4 percent and 18.3 percent of the rural population in countries with protracted crisis and traditional agrifood systems, respectively (Figure 2.4). These countries, mainly in Southern Asia and sub-Saharan Africa, collectively represent over half (55.3 percent) of the world's rural youth.[13] For countries with protracted crisis agrifood systems, rural children and youth below the age of 25 comprise 47 percent of the total population. Given their demographic profiles, these countries are unlikely to face labour shortages in

FIGURE 2.4

YOUTH SHARES IN RURAL POPULATION ARE HIGHEST IN COUNTRIES WITH PROTRACTED CRISIS AND TRADITIONAL AGRIFOOD SYSTEMS



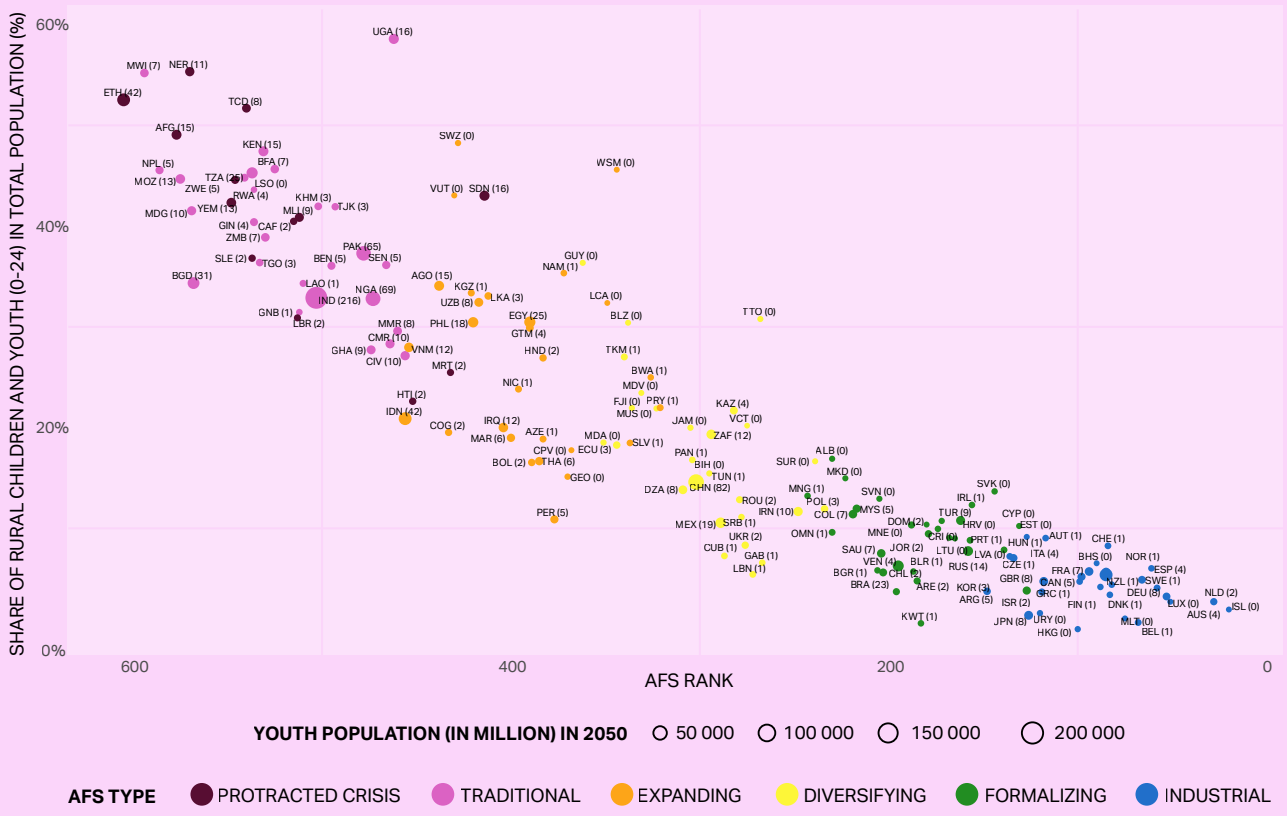
Note: Numbers indicated in black at the top of each panel refer to the average population of youth for the respective agrifood system type.

Source: Author's own elaboration based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton; the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project, funded by the Bill and Melinda Gates Foundation (OPP1134076) (https://dx.doi.org/10.5258/SOTON/WP00647); Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare.

Dataset (https://doi.org/10.6084/m9.figshare.12579572.v4)

FIGURE 2.5

COUNTRIES IN EARLY STAGES OF AGRIFOOD SYSTEMS TRANSITION HAVE LARGE SHARES OF RURAL YOUTH IN THEIR POPULATIONS



Notes: Three letter abbreviations are ISO Alpha-3 codes. For a full list please see: https://unstats.un.org/unsd/methodology/m49/

Source: Author's own elaboration based on data on the share of rural population aged 0–24 out of the total population in 2015 from ILOSTAT ("Population by sex, age and rural/urban areas – UN estimates, July 2024 (thousands)")[27] and the agrifood systems ranking from Quinn et al.[28] Data on the youth population in 2050 is indicated into parentheses and come from UNDESA. 2024. *World Population Prospects – Population Division – United Nations*. New York, USA. [Cited 19 February 2025]. https://population.un.org/wpp/downloadsA value of zero indicates that the youth population in 2050 is less than 1 million. Design adapted from IFAD's 2019 Rural Development Report.[12]

the near term and instead have the potential to harness their large youth populations to drive agrifood systems innovation and rural transformation.

In contrast, countries in the later stages of agrifood systems transition, largely in Europe, Northern America and parts of East Asia and Latin America, collectively account for about 37 percent of the world's rural youth, a relatively lower proportion averaging 11.5 percent, 13.9 percent and 11.4 percent in diversifying, formalizing and industrial agrifood systems, respectively (Figure 2.4). These substantially lower shares reflect broader trends of urbanization and increasing off-farm and non-agrifood system employment opportunities as agrifood systems transition.

Meanwhile, in countries with industrial agrifood systems, rural children and youth below 25 years of age account for only 5 percent of the total population, leading to growing risks of labour shortages and aging rural workforces. These economies, having undergone significant diversification, also offer more non-agrifood system employment opportunities, increasing competition for the shrinking pool of youth labour (see Spotlight 1.1). Without deliberate strategies to make agricultural careers more appealing, these countries will struggle with labour shortages, rising production costs and declining productivity, increasing the strain on existing workers. They also risk stagnation, higher dependence on migrant labour and potential disruptions in food supply chains, which could hinder the sector's ability to adapt to evolving consumer demand, respond to environmental challenges and ensure sustainable food production. These challenges are particularly concerning for labour-intensive agricultural sectors such as horticulture, where mechanization is not always feasible. Evidence from industrialized and formalizing economies suggests that agricultural labour shortages are already emerging as a pressing issue in some countries, with the agriculture sector relying on migrant workers to address these shortages.

> **"MANY RURAL YOUTH LIVE IN AREAS WITH HIGH AGRICULTURAL POTENTIAL BUT POOR MARKET ACCESS.**

OPPORTUNITIES FOR RURAL YOUTH BY AGRIFOOD SYSTEMS TYPE AND LOCAL CONTEXT

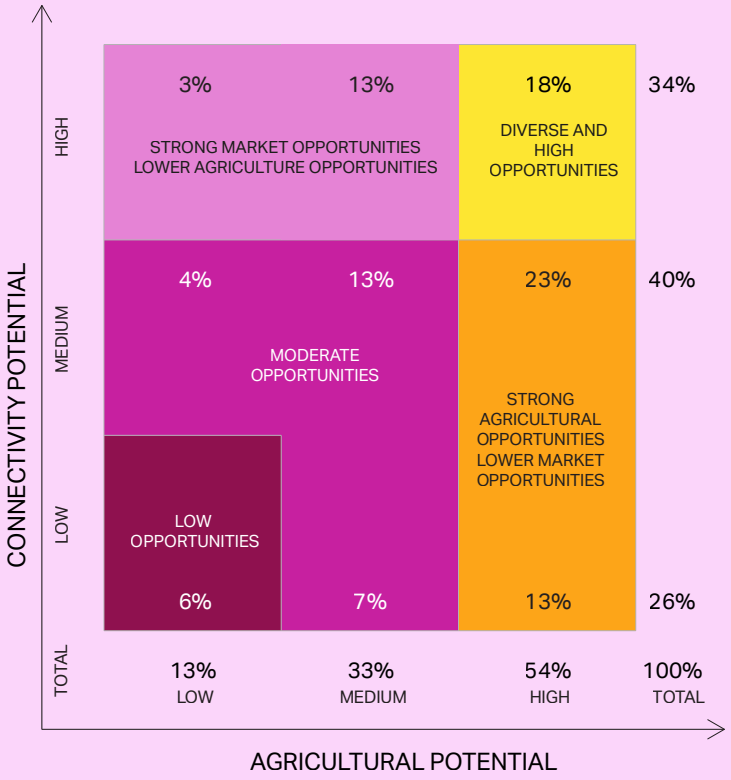
The nature of agrifood systems transition in the areas where youth live influences the opportunities available to them. These distinct opportunities reflect a complex interplay of economic, social, institutional and environmental factors. As agrifood systems evolve, both new opportunities and challenges for youth arise at different stages of the transition. This dynamic is particularly apparent when examining how youth are distributed across agrifood system types and sub-national "opportunity spaces" delineated by varying combinations of agricultural productivity potential and market access conditions (connectivity potential) (see Figure 2.6 and Appendix 1 for the methodology).

Most rural youth are located in areas with favourable agricultural productivity potential. About 54 percent live in high potential zones, 33 percent in medium potential zones and 13 percent in low potential zones (Figure 2.6). This distribution reflects historical migration patterns, with populations gravitating towards areas offering better prospects for agriculture-based livelihoods.[13, 15] However, residing in areas with high potential agricultural productivity – measured solely on biophysical and climatic conditions – does not necessarily translate into access to or benefit from that land, given prevailing barriers such as restrictive social norms and inheritance regimes, land rights and financial constraints (see Chapter 3).[12]

While most rural youth live in areas with strong agricultural potential, connectivity, defined by access to market, infrastructure and services, poses a greater constraint. Only 34 percent reside in high connectivity areas compared with 40 percent in medium connectivity areas and 26 percent in low connectivity areas – twice the proportion of those in low agricultural productivity potential zones (Figure 2.6). The largest single share of rural youth (36 percent) is found in areas with strong agricultural productivity potential but weak market

FIGURE 2.6

MOST RURAL YOUTH LIVE IN AREAS WITH STRONG AGRICULTURAL POTENTIAL AND MODERATE CONNECTIVITY



Notes: Rural areas include peri-urban areas, peri-rural areas and hinterlands.

Source: Author's own elaboration adapting the rural opportunity space framework[12] and based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton); the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur; the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project – funded by the Bill and Melinda Gates Foundation (OPP1134076). https://dx.doi.org/10.5258/SOTON/WP00647); Urban-rural continuum (Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum, figshare. Dataset. https://doi.org/10.6084/m9.figshare.12579572.v4); cell tower (OpenCelliD, https://opencellid.org) cultivation potential (FAO and IIASA. Global Agro Ecological Zones version 4 (GAEZ v4) www.fao.org/gaez).

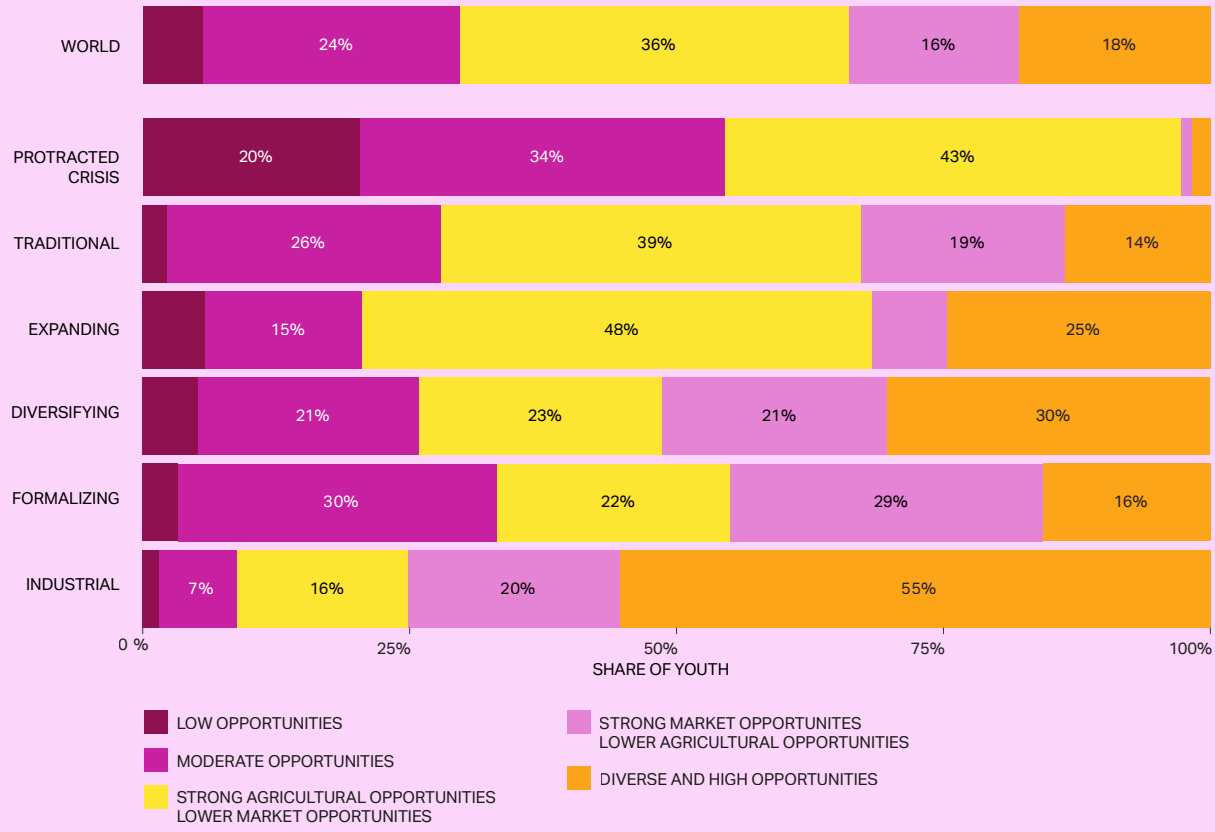
access (Figure 2.7). These findings suggest that addressing infrastructure and market access challenges may be more critical to enhancing youth livelihoods than agricultural potential alone.

Across agrifood system types, opportunities for rural youth vary significantly, reflecting different stages of transition and broader structural conditions. Countries in advanced stages of agrifood systems transition offer the most diverse and high-quality opportunities for their rural youth. In industrial agrifood systems, 55 percent of rural youth reside in areas with both high agricultural productivity potential and strong market access conditions, while only 2 percent live in areas with low opportunities (Figure 2.7).

In contrast, youth living in countries in the early stages of agrifood systems transition (protracted crisis and traditional agrifood systems) face the most severe constraints.[28] These include most countries in sub-

FIGURE 2.7

RURAL YOUTH OPPORTUNITIES ARE HIGHEST IN INDUSTRIAL AGRIFOOD SYSTEMS AND MOST CONSTRAINED IN PROTRACTED CRISIS AND TRADITIONAL SYSTEMS



Source: Author's own elaboration adapting the rural opportunity space framework[12] and based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton); the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project – funded by the Bill and Melinda Gates Foundation (OPP1134076) https://dx.doi.org/10.5258/SOTON/WP00647); Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare. Dataset. https://doi.org/10.6084/m9.figshare.12579572.v4); cell tower (OpenCelliD, https://opencellid.org) and crop cultivation potential (FAO and IIASA. Global Agro Ecological Zones version 4 (GAEZ v4) www.fao.org/gaez).

Saharan Africa, North Africa and Western Asia. In protracted crisis contexts, about 20 percent of rural youth reside in low opportunity areas characterized by limited agricultural productivity potential and market access. Only 2 percent live in areas offering diverse and high opportunities. Most youth (43 percent) inhabit and work in areas with strong agricultural productivity potential but limited market access, often exacerbated by conflict,

instability and resource constraints.[12, 29] Countries with traditional agrifood systems present similar patterns, but with a larger share of youth (14 percent) living in areas with diverse and high opportunities (Figure 2.7).[30–32]

Countries at intermediate transition stages characterized by expanding, diversifying and formalizing agrifood systems offer a more mixed picture. Predominantly located in Latin America, South-eastern, Southern and Eastern Asia, these contexts have higher shares of rural youth in areas with diverse and high opportunities and may offer a broader range of livelihood options across on-farm and off-farm segments of agrifood systems relative to traditional or protracted crisis agrifood systems.[3]

CLIMATE CHANGE AND RURAL YOUTH PROSPECTS

Agrifood systems are highly susceptible to environmental degradation and the multifaceted impacts of climate change,[33,34] both of which are expected to amplify variability in agricultural production and affect agricultural productivity (see also Chapter 6).[24] These changes could adversely impact economic opportunities in rural spaces.

To understand how variability in climate would affect young people's economic prospects, current agricultural productivity potentials in the areas where youth live were compared with future projections derived from climate models. The analysis first identified regions undergoing climate change induced shifts in agricultural productivity potential. The total land cover and number of rural youth residing in these areas and their relative shares were then estimated for each of these regions.

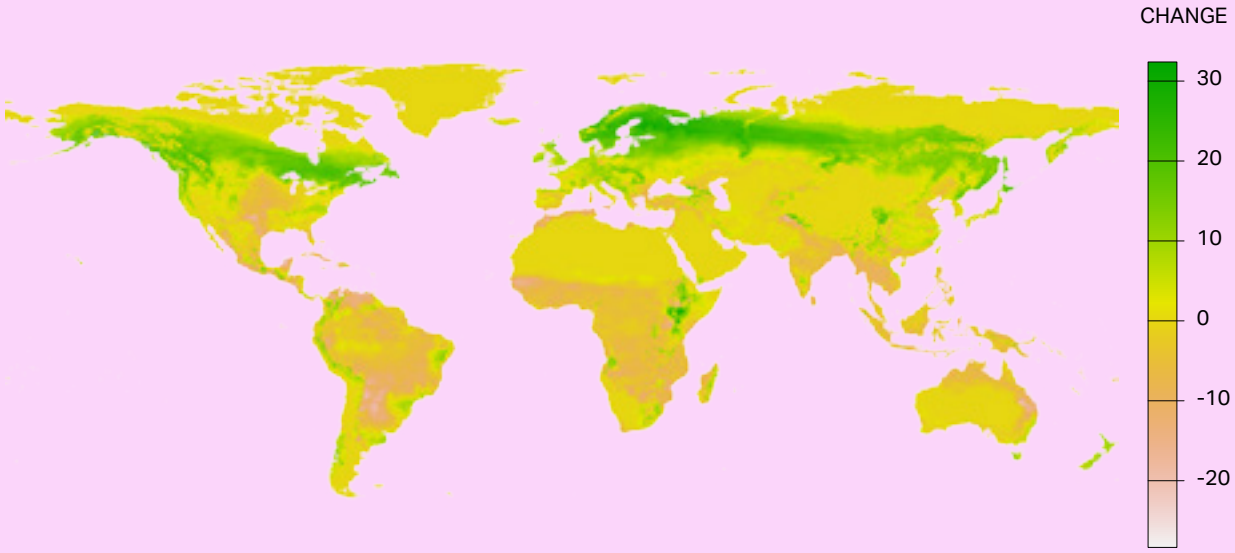
CLIMATE CHANGE UNEVENLY SHAPES GLOBAL AGRICULTURAL POTENTIAL

While projected shifts in agricultural productivity suggest that climate change will reshape food production potential worldwide, the benefits will be unevenly distributed. The modelled scenario projects a net gain of approximately 182.6 million hectares of land with improved productivity potential. However, this net increase does not account for associated risks, including extreme weather events, prolonged droughts and widespread wildfires, which could undermine the reliability of existing and newly viable agricultural lands for long-term food production.[33,34]

Significant regional disparities will emerge. The northern hemisphere, particularly Europe and Northern America, is expected to see productivity gains, with localized decreases in parts of the eastern coast of Australia, the Mediterranean coastline and the central United States of America (Figure 2.8). In contrast, large declines are projected across Latin America and the Caribbean, South America, sub-Saharan Africa, South Asia and Southeast Asia. While new areas may become more viable for agriculture[35] these are often sparsely populated, whereas declines will affect regions that currently sustain large populations, intensifying food security challenges.

FIGURE 2.8

CLIMATE CHANGE IS EXPECTED TO IMPACT AGRICULTURAL PRODUCTIVITY POTENTIAL UNEVENLY ACROSS THE GLOBE



Notes: Refer to the disclaimer on page ii for the names and boundaries used in this map.

Source: Author's own elaboration using historical and estimated crop cultivation potential based on the IPSL-CM5A-LR model and the RCP 8.5 scenario – a high-emissions trajectory – spanning 2040 to 2070 (FAO and IIASA. Global Agro Ecological Zones version 4 (GAEZ v4) www.fao.org/gaez).[47] Climate change projections simulate the effects of anticipated climatic changes, highlighting the potential challenges posed to agricultural systems under continued high emissions.

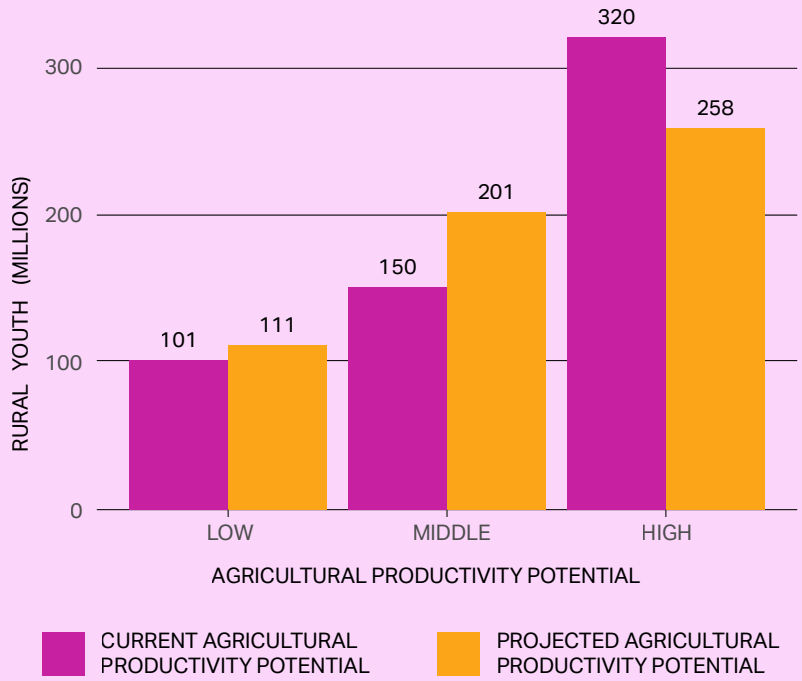
CLIMATE-DRIVEN PRODUCTIVITY DECLINES AND RURAL YOUTH OPPORTUNITIES

An estimated 395 million rural youth, representing about 69 percent of the global rural youth population, currently reside in regions projected to experience declines in agricultural productivity potential due to the adverse effects of climate change. Among them, about 111 million live in areas expected to experience low agricultural productivity potential – a 10 percent increase from a scenario without climate change. At the same time, the number of rural youth in high productivity areas is projected to decline by 19 percent due to climate change (Figure 2.9).

> **AROUND 395 MILLION RURAL YOUTH ARE EXPECTED TO FACE CLIMATE-INDUCED DECLINES IN AGRICULTURAL PRODUCTIVITY.**

FIGURE 2.9

MANY RURAL YOUTH LIVE IN AREAS PROJECTED TO EXPERIENCE DECLINES IN AGRICULTURAL PRODUCTIVITY POTENTIAL DUE TO CLIMATE CHANGE

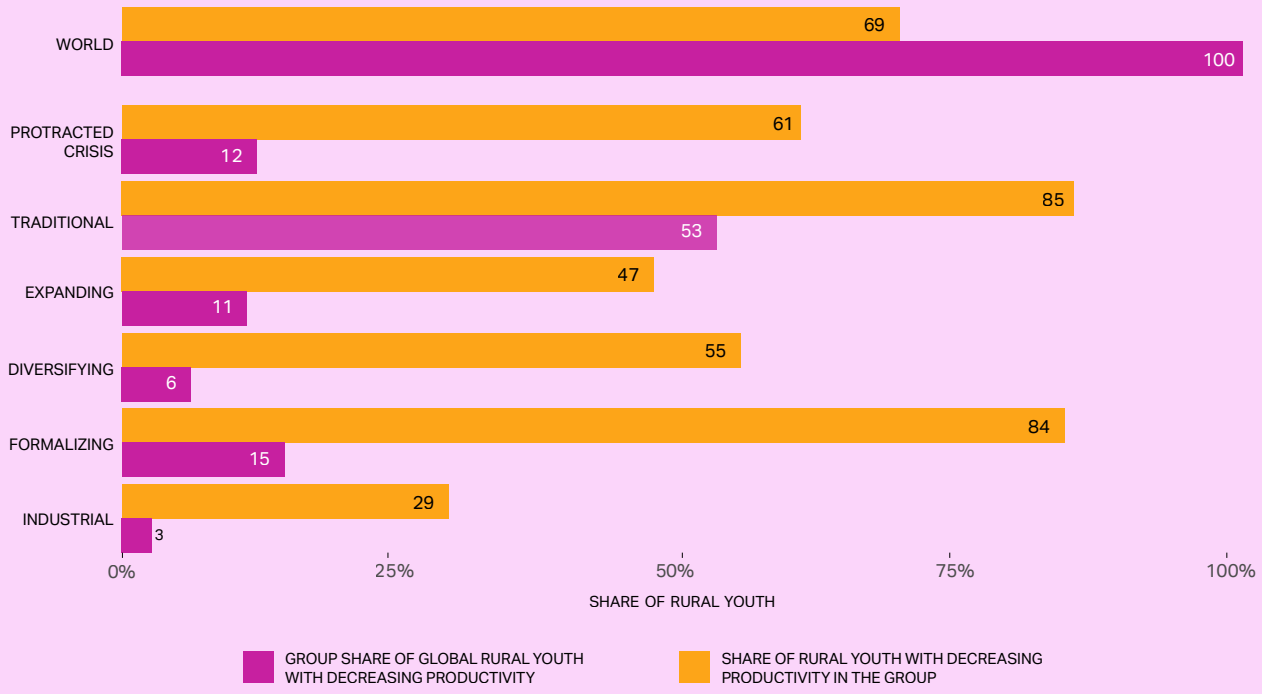


Source: Author's own elaboration based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton; the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project, funded by the Bill and Melinda Gates Foundation (OPP1134076) (https://dx.doi.org/10.5258/SOTON/WP00647); Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare. Dataset (https://doi.org/10.6084/m9.figshare.12579572.v4); and crop cultivation potential (FAO and IIASA. Global Agro Ecological Zones version 4 (GAEZ v4) www.fao.org/gaez).

Disaggregated analysis by agrifood systems typology reveals stark disparities in rural youth vulnerability to climate-induced declines in agricultural productivity potential. These differences reflect the interaction of climate risks, weaknesses in how agrifood systems operate and resource inequalities across different regions. Traditional agrifood systems are the most vulnerable, with 85 percent of rural youth in these systems – representing 53 percent of the global rural youth population – facing declining agricultural productivity potential (Figure 2.10). Two-thirds of rural youth in sub-Saharan Africa and 82 percent in Western Asia reside in areas projected to experience significant declines (Figure A5.1 in Appendix 5). In sub-Saharan Africa, in particular, limited infrastructure, outdated technologies and restricted access to adaptation resources leave rural youth ill-equipped to adapt.[12, 37] In such circumstances, migration – whether voluntary or forced – can become inevitable.[38] Over 9 million additional rural youth living in areas with low agricultural potential will further exacerbate these challenges. Rural youth in agrifood systems at intermediate stages of transition also face heightened vulnerability. Approximately 84 percent of youth in formalizing

FIGURE 2.10

FIGURE 2.10 RURAL YOUTH LIVING IN TRADITIONAL AGRIFOOD SYSTEMS ARE MOST IMPACTED BY EXPECTED DECLINING PRODUCTIVITY FROM CLIMATE CHANGE



Source: Author's own elaboration based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton; the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project, funded by the Bill and Melinda Gates Foundation (OPP1134076) (https://dx.doi.org/10.5258/SOTON/WP00647); Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare. Dataset (https://doi.org/10.6084/m9.figshare.12579572.v4); crop cultivation potential (FAO and IIASA. Global Agro Ecological Zones version 4 (GAEZ v4) www.fao.org/gaez).

and 55 percent in diversifying agrifood systems are projected to experience declining productivity potential.

In contrast, rural youth in industrial agrifood systems, primarily in Europe and Northern America and parts of East Asia, are the least affected. Only 29.1 percent of youth in these systems are projected to experience impacts, representing 2.7 percent of the global total of affected youth. In some areas, climate change may improve agricultural productivity potential, reducing the number of youth in low-productivity regions.[35] The disparities in youth vulnerability across regions and agrifood systems typologies underline systemic inequality in exposure to climate risks.

UNPACKING YOUTH MOBILITY

Youth are historically willing to migrate in search of better opportunities and/or for reasons related to work, education or family decisions.[39] This mobility enables them to access new areas, livelihoods and resources,[40] particularly when opportunities in their place of origin are limited or declining.[41, 42] However, many young people face significant challenges to migration, including high financial costs, constraining social norms, lack of information, and limited access to networks or support systems in destination areas. Youth may also be reluctant to leave due to cultural and social ties.[43] Youth migration can bring valuable skills and help fill labour gaps in destination areas, but when movements are unmanaged, they can strain the infrastructure and services of host communities, limiting young migrants' access to decent employment. Understanding the potential and the limitations of youth mobility is key to designing inclusive policies and programmes – both at origin and destination – that can expand youth opportunities and support resilient and inclusive agrifood systems transition (see Chapter 7).

Youth engage in various types of migration including temporary, cyclical or seasonal movements. Migration can be internal (within their own country) or international (abroad) and undertaken alone or with family, and through regular or irregular channels. Many migrants move multiple times throughout their lives.[44] Internal and international migration are often linked, as migrants tend to move in phased steps, from villages to towns or cities, and then internationally.[45] This section examines patterns of youth migration – defined as the movement of young people away from their place of usual residence, either across an international border or within a state,[46] exploring its types, drivers and associated opportunities and challenges.

INTERNATIONAL AND REGIONAL MIGRATION

Over recent decades, the number of international migrants has increased significantly, reaching 304 million in 2024,[47] with corresponding increases in remittances to low- and middle-income countries projected to reach USD 685 billion in the same year.[48] Youth migration has also grown, with the number of international migrants aged 15–24 rising from 22.1 million in 1990 to 31.7 million in 2020. However, their share out of total migrants declined from 14.4 percent to 11.3 percent over the same period,[49] due in part to longer life expectancy among older migrants and migration policies that restrict access for lower-skilled migrants, who tend to be younger.[14, 50, 51]

The share of youth among international migrants varies across regions. Youth account for 16.2 percent of the total migrant population in sub-Saharan Africa and 15.2 percent in Eastern and Southeastern Asia and Latin America and the Caribbean, but only 9.2 percent in Europe and Northern America. Youth aged 20–24 account for the majority of migrants (19 million or 6.8 percent of the total migrant population), compared to those aged 15–19 (12.5 million or 4.5 percent).[49] Young women represent nearly half of international youth migrants (48 percent), with higher shares in sub-Saharan Africa (52 percent) and Eastern and Southeastern Asia, as well as Latin America and the Caribbean (51 percent).[49]

The share of international youth migrants residing in low- and middle-income countries (43 percent) is larger than that of older migrants (37 percent aged 25–34 and 30 percent aged 35–44).[50] This trend may reflect in part the broader demographic reality that the majority of the world's youth live in low- and middle-income countries. However, it also highlights a key characteristic of global migration – most international migrants, including youth,

tend to move within their own regions. Europe has the highest intra-regional migration share (74 percent), followed by sub-Saharan Africa (64 percent). Youth migrants are more likely than older cohorts to choose regional destinations due to geographic proximity, lower migration costs, and strong cultural, linguistic and economic ties.[50,52] Some regions such as Central and Southern Asia experience large migrant outflows, with 78 percent of migrants residing outside their region, particularly in member states of the Gulf Cooperation Council. Similarly, 60 percent of migrants from Latin America and the Caribbean live in Northern America, their movement contributing to one of the largest global migration corridors, although growth has slowed in recent years.[49] Crucially, children and youth make up a large share of forcibly displaced populations, including refugees, asylum seekers and internally displaced persons (see Box 2.1).

ASPIRATIONS AND PLANS TO MIGRATE INTERNATIONALLY

Youth express higher aspirations for international migration than adults across all agrifood systems typologies, with aspirations rising between 2015 and 2023 (Figure 2.11). In 2023, 46.6 percent of male and 45.5 percent of female youth expressed a desire to migrate compared to approximately 36 percent in 2015. Migration aspirations among youth are lowest in industrial agrifood systems and highest in countries with protracted crisis agrifood systems, where 61.8 percent of young males aspire to migrate (Figure 2.11) (see also Box 2.2). In such fragile contexts, such as Eritrea, where economic prospects are limited, youth often view migration as the only pathway to a better life.[53] However, many young people may be unable to migrate due to financial and institutional barriers, and remain trapped in their present circumstances.[54]

BOX 2.1 FORCED DISPLACEMENT

Children and youth represent a significant portion of the forcibly displaced (internally displaced persons, refugees, asylum seekers and other people in need of international protection). At the end of 2023, an estimated 117.3 million people worldwide were forcibly displaced due to persecution, conflict, violence or human rights violations, of which 68.3 million were internally displaced.[i] Some 40 percent of the forcibly displaced are under the age of 18.[i] According to the Internal Displacement Monitoring Centre (IDMC), in 2021, some 33 million children and young people under the age of 25 were internally displaced, of which 25.2 million were under the age of 18, and 11.4 million were between the ages of 15 and 24.[ii] Most refugees remain close to their countries of origin, with 69 percent hosted in neighbouring countries. Low- and middle-income nations continue to host three-quarters of the world's refugees.[i]

Children and youth face heightened risks during displacement, including exposure to violence, abuse and disruption of critical developmental milestones such as education. Girls are particularly vulnerable to these risks, as displacement often exacerbates barriers to education and increases the risk of sexual violence. The long-term consequences of displacement, if unaddressed, can have a lasting impact, limiting future opportunities and perpetuating cycles of vulnerability. Addressing the specific needs of youth and children – such as healthcare (including vaccinations), education and vocational training – is essential to mitigating these risks, boosting their resilience and supporting their development.[iii]

Notes: Refer to the **Notes section** for full citations.

In protracted crisis and traditional agrifood systems, male youth are more likely than female youth to aspire to migrate internationally, reflecting gender norms that favour men's work outside the home.[55] However, in other agrifood systems, migration aspirations do not differ notably by gender.

Despite high aspirations, few youth actively plan to migrate in the next year and even fewer have made concrete preparations for such moves (Figure 2.12; Information about plans and preparations to migrate internationally were only collected in 2015 Gallup World Poll data). This gap between aspirations and actual plans to migrate likely reflects the significant barriers young people face, including financial constraints, limited access to information and restrictive migration policies that limit migration opportunities.[40] In addition, young people may hold aspirations to migrate internationally for

© IFAD/LAISIASA DAVE/ PACIFIC FARMER ORGANIZATIONS
IN NAVOSA, FIJI, YOUNG FARMER FILIPE BAITUWAWA IS GROWING NUTRITIOUS VEGETABLES FOR HIS COMMUNITY, AFTER RECEIVING TRAINING AND FARMING INPUTS TO BOOST LOCAL FOOD SECURITY DURING THE COVID-19 LOCKDOWN.

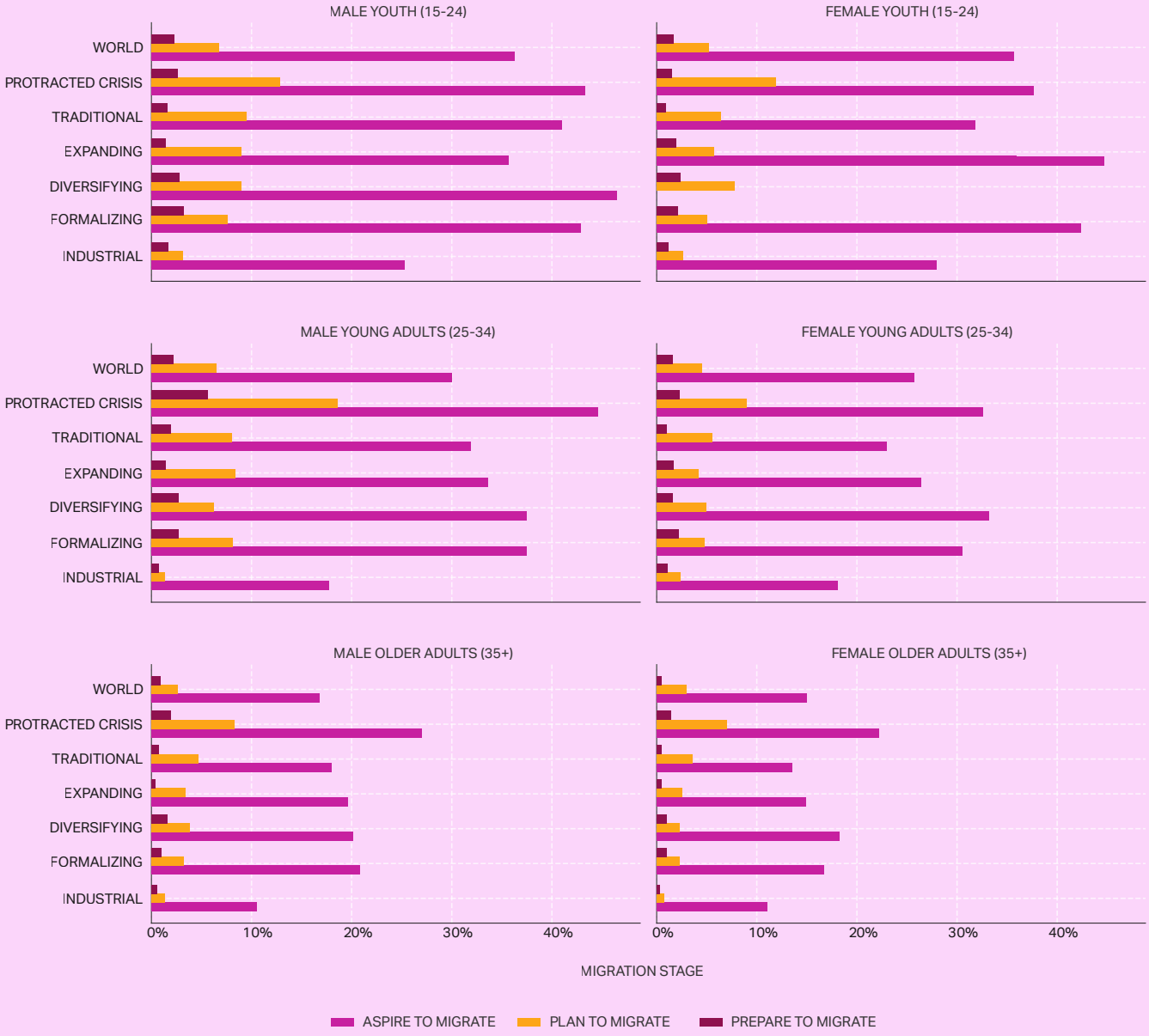
FIGURE 2.11

THE SHARE OF YOUTH ASPIRING TO MIGRATE INTERNATIONALLY INCREASED BETWEEN 2015 AND 2023 ACROSS MOST AGRIFOOD SYSTEM TYPES

Source: Author's estimates based on Gallup World Poll datasets for 2015 and 2023. The estimates are unweighted averages derived from pooled survey data across different agrifood system typologies. The plots show the proportion of individuals who aspire to migrate across different agrifood system typologies based on pooled survey data from over 120 countries for the years 2015 and 2023. The agrifood systems typology averages are derived by computing the weighted mean of migration aspirations within each typology, ensuring representation across all included countries. The world average is similarly computed by pooling all countries together, providing a global estimate of migration aspirations. The estimates were produced using adjusted survey weights following Heckert *et al.*[56]

FIGURE 2.12

ASPIRATIONS TO MIGRATE INTERNATIONALLY ARE HIGHEST AMONG YOUTH, ESPECIALLY IN PROTRACTED CRISIS SYSTEMS, BUT RELATIVELY FEW HAVE MADE PLANS OR PREPARATIONS TO MIGRATE IN THE NEXT 12 MONTHS



Note: The figure shows the share of youth who aspire to migrate, plan to migrate or have made preparations to migrate in the next 12 months, disaggregated by sex and agrifood system typology.

Source: Author's estimates using the Gallup World Poll dataset for 2015. The estimates were produced using adjusted survey weights following Heckert et al.[56]

years, but the period of active preparation could be much shorter. Changes in conditions at destination, including labour demands and migration policy shifts towards border restrictions or the opening of legal pathways for migration, can also influence if and when migration aspirations transform into actual migration.[40] Key drivers of international and internal migration among youth are discussed later in the chapter.

YOUTH MIGRATION WITHIN NATIONAL BORDERS

While international migration often receives the most attention, the majority of migration occurs within national borders, [45] especially among youth, who typically lack the financial resources and networks necessary to migrate internationally.

BOX 2.2 YOUTH MIGRATION TO EUROPE – MIGRANT CHARACTERISTICS AND KEY MIGRATION DETERMINANTS

In 2023, the International Organization for Migration (IOM) published data capturing the experiences of migrants aged 14–24 travelling to Europe by sea and land. These journeys, often perilous, reflect young individuals' aspirations for better futures as well as their need to escape crises or violence in their home countries. The data were gathered using the Displacement Tracking Matrix (DTM), a set of tools developed by IOM to gather and analyse information on the mobility, vulnerabilities and needs of mobile and displaced populations.

Young migrants came from a diverse range of countries, of which Afghanistan (15 percent), Morocco (12 percent), Pakistan (9 percent), Bangladesh (7 percent) and Guinea (6 percent) are the most common. Some 90 percent of the surveyed youth migrants were boys and young men, with higher shares of females coming from specific countries.

Economic challenges and escaping conflict and personal violence were major migration drivers. Over a third (37 percent) of respondents were unemployed and actively seeking work before departure, while another 37 percent were employed, and only 15 percent were students. Education levels varied widely, with 51 percent having no or only primary education, 45 percent having completed either lower or upper secondary, and only 4 percent having a tertiary education. On average, young women migrants had slightly higher education levels than young men. Of all migrants, 92 percent were single, though for young women, 27 percent were in a couple and 21 percent had children (compared to only 3.5 percent of males).

Agriculture, forestry and fisheries were prominent sectors of employment among young migrants before their departure, particularly in Pakistan (41 percent) and Bangladesh (34 percent). Environmental degradation, including worsening droughts, soil erosion and rising temperatures, were cited, particularly in North Africa. For example, 40 percent of young Algerians and 19 percent of young Moroccans cited slow-onset environmental changes as a key factor in their decision to migrate.

Socioeconomic opportunities, safety and family networks were key factors influencing their choice of destination, with approximately one-third of respondents indicating they had extended family members in Europe.

Source: Based on information derived from IOM. 2024. *DTM Europe – youth on the move, travelling by sea and by land to Europe in 2023*. Grand-Saconnex, Switzerland. https://dtm.iom.int/reports/europe-youth-move-travelling-sea-and-land-europe-2023

Evidence from Demographic Health Surveys in 26 countries – primarily from sub-Saharan Africa, with some from Asia and Europe – shows that youth internal migration rates are generally high and vary significantly by country and gender (Figure 2.13). Young women (aged 15–24) are in most cases more likely than young men to have migrated within their country at least once in their life, contrary to international migration patterns. Among female youth, the incidence of internal migration ranges from 87 percent in Bangladesh to 14 percent in Armenia and Tajikistan. For male youth, the incidence ranges between 61 percent in Gabon to 4 percent in Armenia. Only three countries in the sample – Cambodia, Gabon and Mozambique – have a notably higher incidence of internal migration among male youth than female youth, while in the United Republic of Tanzania and Timor-Leste, female and male youth report migration at similar rates.

In most cases, female youth migrate internally at younger ages than male youth, with the probability of having migrated in the last five years peaking around the age of 22 for women and the age of 25 for men (see Figure 2.14).

> **MOST YOUNG PEOPLE MIGRATE WITHIN THEIR OWN COUNTRIES RATHER THAN CROSSING INTERNATIONAL BORDERS.**

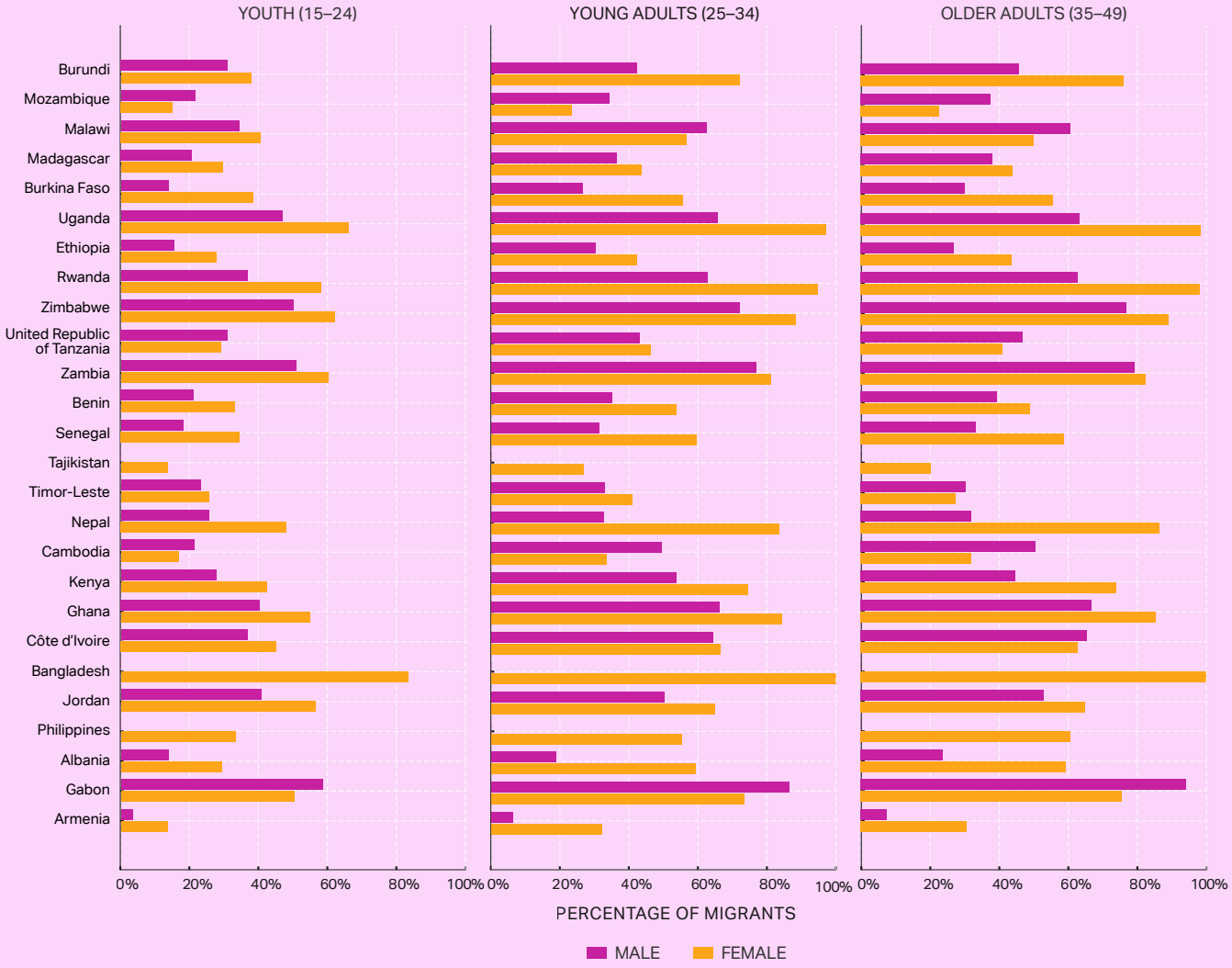
Female youth often migrate earlier, due to marriage, as detailed further below, while young men tend to migrate later, primarily for employment, often after completing education.[54] The gender gaps in migration rates are smaller among older adults in many countries, but in general women continue to have a higher probability of migrating during their life.

© IFAD/ASAD ZAIDI
IN SINDH, PAKISTAN, 28-YEAR-OLD GOHAR COLLECTS ROSES ON HER FARM AFTER TAKING A LOAN OF 10 000 RUPEES TO BUY GOATS AND SUPPORT HER LIVELIHOOD.

FIGURE 2.13

YOUNG WOMEN ARE MORE LIKELY THAN YOUNG MEN TO MIGRATE INTERNALLY

The share of individuals who have ever migrated, by sex and age group



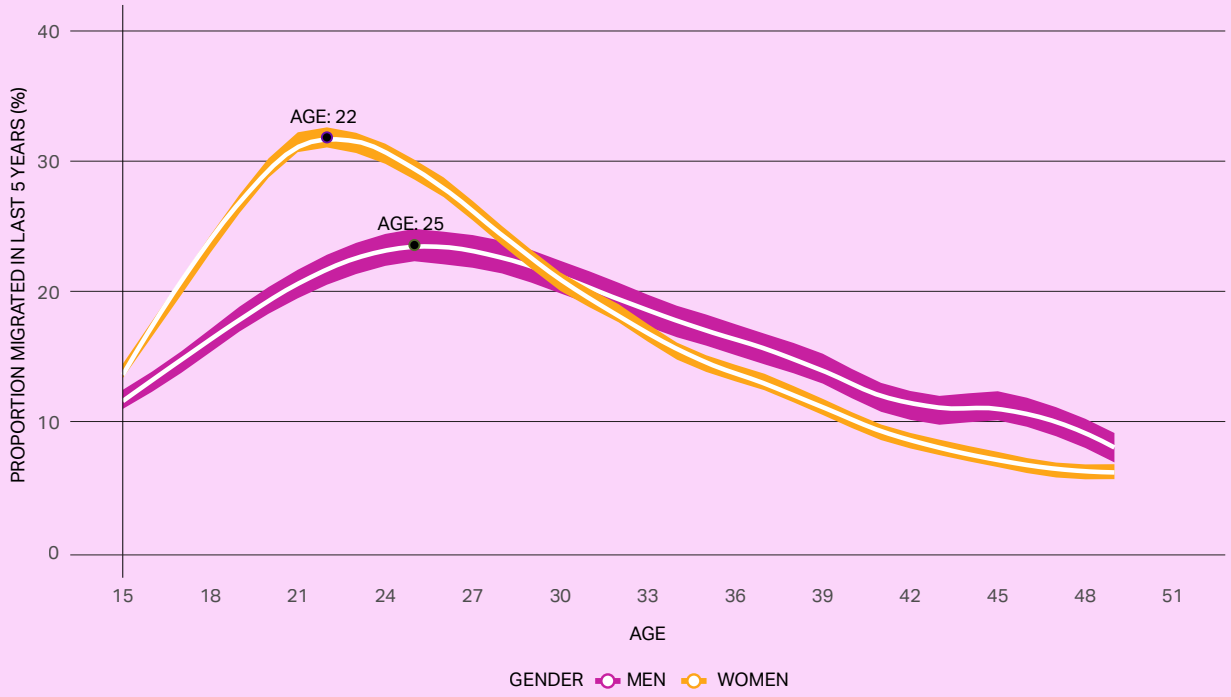
Notes: The countries are arranged by GDP per capita in PPP. In these surveys, male and female respondents aged 15–49 were asked if they had always lived in their current place of residence. If their responses were negative, they were asked where they moved from and when, enabling an examination of migration patterns between and within rural and urban areas. Migrants are individuals who have not always lived in their current place of residence and have thus relocated at least once between their birth and the time of the interview. Therefore, these datasets identify youth migrants at the place and households of destinations, not in the household or place of origin. Ten of the surveys also inquire about reasons to migrate.

Source: Author's calculations based on 26 national-level datasets from the Demographic Health Surveys (DHS) for selected countries with migration information.

FIGURE 2.14

INCIDENCE OF MIGRATION PEAKS AROUND AGE 22 FOR WOMEN AND 25 FOR MEN

Proportion of individuals who migrated in the past five years, calculated as a share of the total population by age and sex



Note: Coloured, shaded areas represent the 95-percent confidence intervals.

Source: Author's calculations based on data from the Demographic Health Surveys (DHS) for selected countries with migration information. The trend for women is based on data from 26 countries: Albania, Armenia, Bangladesh, Benin, Burundi, Burkina Faso, Cambodia, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Jordan, Kenya, Madagascar, Malawi, Mozambique, Nepal, Philippines, Rwanda, Senegal, Tajikistan, United Republic of Tanzania, Timor-Leste, Uganda, Zambia and Zimbabwe. The trend for men is based on 23 of these countries; Bangladesh, Philippines and Tajikistan are excluded due to data unavailability for men.

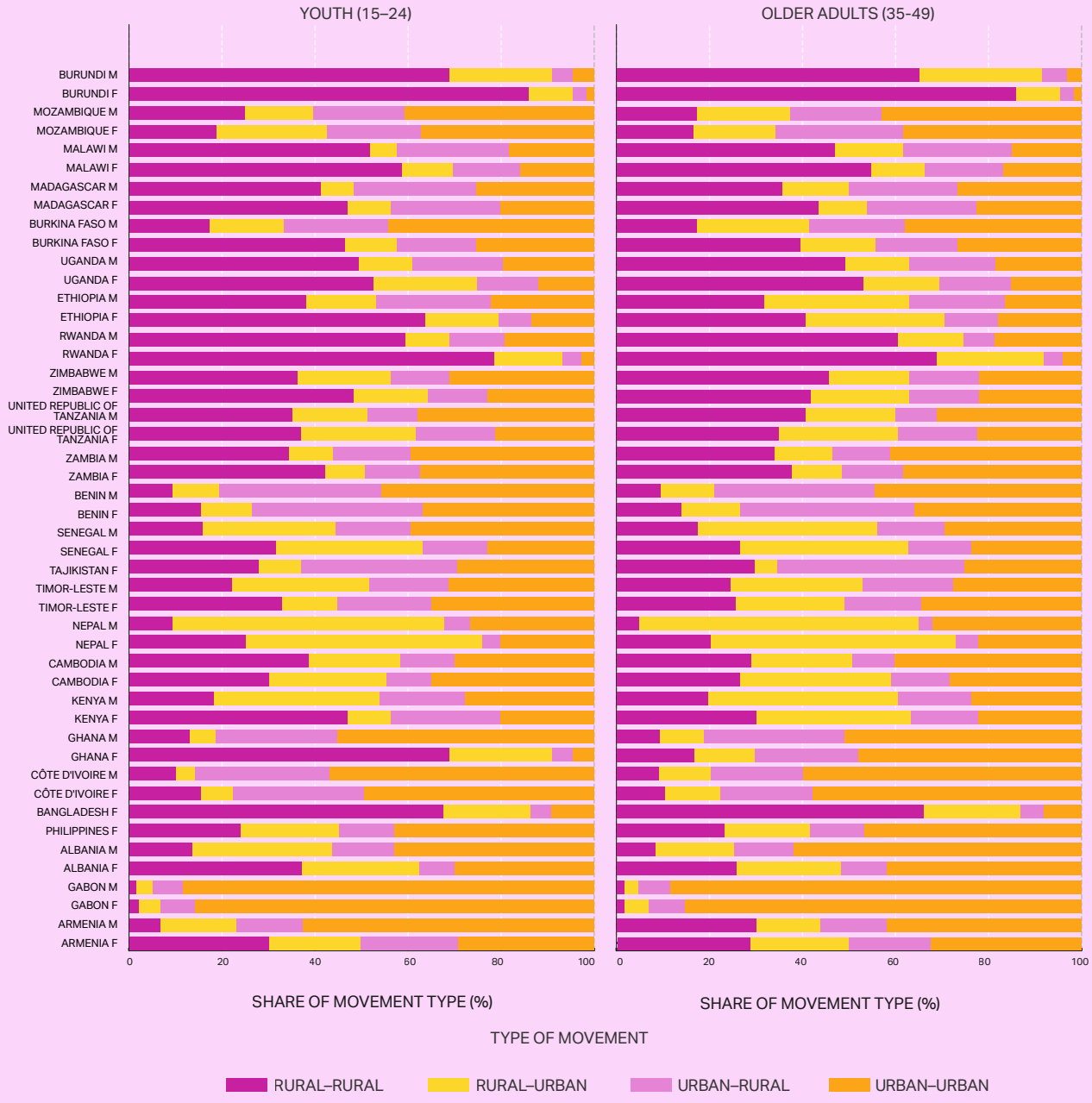
There is significant heterogeneity in the direction of youth migration patterns across the selected countries. Around 30 percent of youth migrants engage in rural-to-rural[a] migration across the entire set of countries, but this type of migration is particularly important at lower levels of GDP per capita (Figure 2.15). For instance, in both Burundi and Rwanda, over 60 percent of young migrants are rural-to-rural migrants. Other studies also show that on average in low- and middle-income countries, more people migrate between rural areas than from rural to urban areas,[45, 57] often in search of arable land. On average, young women are more likely than young men to migrate between rural areas.

a The DHS surveys differentiate between rural, urban and towns. The definition of towns can vary significantly across countries. To simplify the analyses, towns have been aggregated into either the rural or urban category, depending on the country, with the decision informed by country-specific reports produced by the DHS initiative. In most cases, towns are classified as urban, but there are exceptions.

FIGURE 2.15

RURAL-TO-RURAL YOUTH MIGRATION IS PROMINENT, PARTICULARLY IN COUNTRIES AT LOWER LEVELS OF ECONOMIC DEVELOPMENT

The types of migration patterns, by sex and age group



Source: Author's calculations based on data from the Demographic Health Surveys (DHS) for 26 countries with migration information. The countries are arranged by GDP per capita in PPP. Migrants are defined as those individuals who have migrated at least once between their birth and the time of the interview.

Rural-to-urban migration varies by country (Figure 2.15). In Nepal, over 60 percent of young male migrants migrate from rural to urban areas, whereas in Gabon, Ghana and Tajikistan the proportion is relatively small. Additionally, no consistent gender patterns have been identified in rural-urban migration.

Urban-to-rural migration is also notable (Figure 2.15), with movement patterns indicating circular and seasonal movements or return migration. In many cases, youth work in cities to save money before returning to begin a family and start their own farm.[58] A study in Nairobi noted that 41 percent of male migrants aspired to return to their villages in the next 12 months, and 76 percent planned to return permanently.[59] Young female migrants, however, were less likely to express an interest in returning permanently to their villages.[59]

Urban–to-urban migration is more common in higher income and highly urbanized countries, where it tends to dominate migration patterns (Figure 2.15). In Albania, for instance, migration between urban areas accounts for 62.2 percent and 42.1 percent of male and female youth migration, respectively. In Gabon, where most of the population live in urban areas, over 85 percent of migration for both male and female youth occurs between cities.[60] Migration to and from urban areas may involve smaller towns rather than major cities, as towns are typically classified as "urban" in Demographic and Health Surveys. Box 2.3 offers a more detailed analysis of youth migration along the rural–urban continuum in East and West Africa.

Migration patterns among older cohorts mirror the youth cohort, reflecting the fact that many migrants relocate to their current residence before the age of 25.

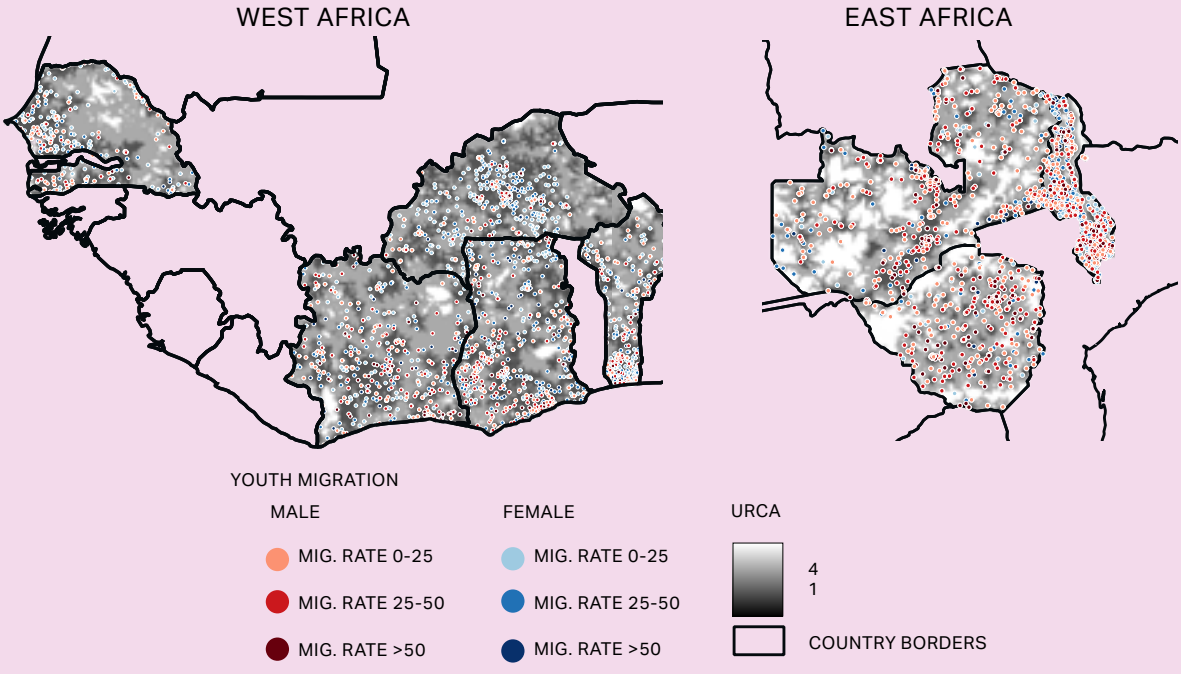
© FAO/ANIS MILI
IN GOUBELLAT, TUNISIA, INÈS MESSAOUDI HOLDS A ROMAN JAR FILLED WITH OIL WHILE WORKING IN AN OLIVE GROVE.

BOX 2.3 SPATIAL PATTERNS OF YOUTH MIGRATION IN WEST AND EAST AFRICA

Youth migration is not limited to large cities, with many young people also migrating to peri-urban and intermediate cities. In the United Republic of Tanzania, youth often migrate to nearby secondary towns, which offer off-farm jobs and are more accessible financially than big cities, allowing easy return to their home villages if needed.[i] Rural–urban distinctions are commonly used in analysis, including in this report, due to limitations in geospatial data, but they mask a more nuanced understanding of youth mobility across the urban–rural continuum. Taking advantage of the availability of geo-referenced data from several Demographic Health Surveys, the variation in youth migration rates is examined across space and by gender. Rural youth migration rates, calculated at the survey cluster and focused on youth who have migrated in the five years preceding the survey, are overlayed on the urban-rural catchment areas (URCA) maps[ii, iii] (Figure A). Youth migration rates are measured at destination.

Urban and peri-urban areas attract a large share of migrants. Female youth migrate to both urban and rural areas. [iv, v] In contrast, male youth migration is largely towards urban centres [vi], particularly peri-urban areas. These gendered patterns are more pronounced in countries in West Africa than in East Africa. The spatial mobility patterns reinforce the findings that female and male youth migration are frequently motivated by different factors. [vii–ix]

FIGURE A. YOUTH MIGRATION RATES BY GENDER ACROSS THE URCA SPACE



Notes: Refer to the disclaimer on page ii for the names and boundaries used in this map. Urban and peri-urban areas are marked in darker shades of grey on the maps. Categories for DHS clusters are: "Mig. Rate 0–25" for cluster with migration rate above 0 and below 26 percent, "Mig. Rate 26–50" for clusters with migration rate equal or greater than 26 percent and below or equal to 50 percent, and "Mig. Rate >50" for clusters with a migration rate above 50 percent. Clusters with no migration (i.e. the migration rate is 0) are excluded from the analysis.

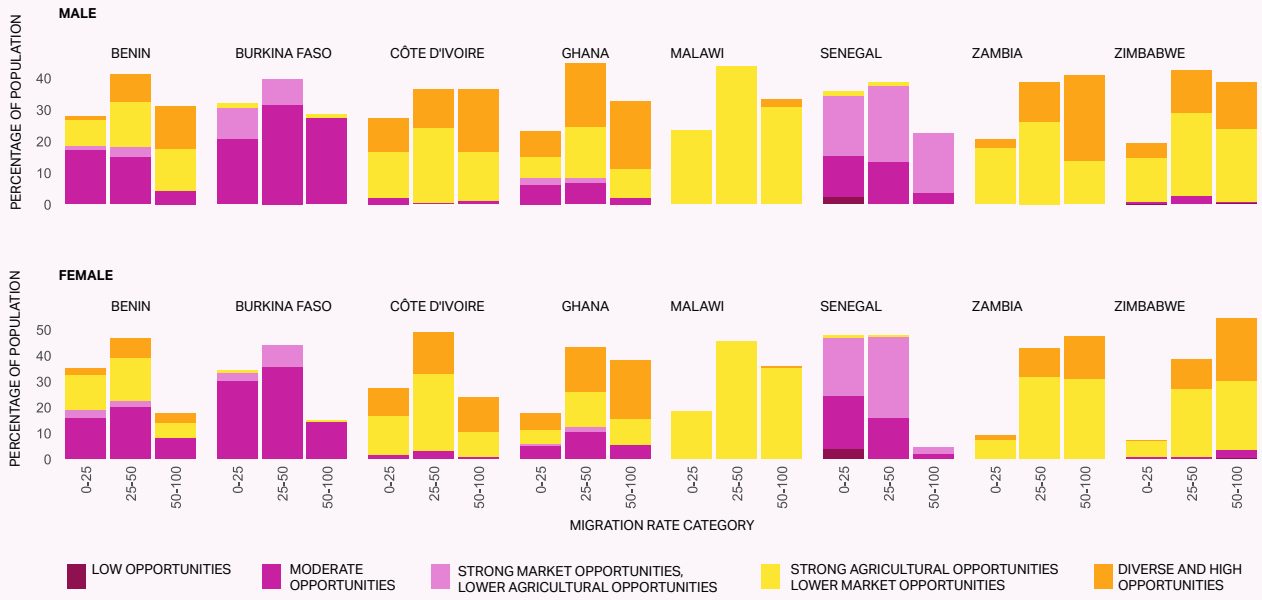
Source: Author's own elaboration based on data from the Demographic Health Surveys (DHS) for selected countries.

BOX 2.3 SPATIAL PATTERNS OF YOUTH MIGRATION IN WEST AND EAST AFRICA

The spatial distribution of youth migration is also explored across opportunity spaces (see Appendix 1). Figure B shows the distribution in each country of the shares of male and female youth migrants according to the type of space in which they live.

Larger shares of young migrants live in areas with higher opportunities. These are areas with higher market connectedness and agricultural potential, thus offering enhanced opportunities in terms or employment, education, agripreneurship and access to markets (marked in blue). Across all countries but Burkina Faso and Senegal, clusters with more than 50 percent of young migrant display larger shares of rural young migrant living in areas characterized by both high agricultural and market opportunities, which could signal the fact that youth moved seeking better livelihood options. In most countries, large shares of young migrants live in areas with strong agricultural opportunities (either with strong or moderate market opportunities, marked in green). This is not surprising, given that all countries but Zimbabwe, in the sample have traditional agrifood systems, with higher reliance on the agriculture sector, and where rural-to-rural migration is prevalent (see Figure 2.15). Senegal stands out as an exception, where youth migration is directed toward areas with strong market opportunities but lower agricultural potential (purple), as well as areas with moderate opportunities (orange). This likely reflects youth engagement in urban informal off-farm agrifood system roles, such as street vending.

FIGURE B. YOUTH MIGRATION RATES BY GENDER ACROSS OPPORTUNITY SPACES



Notes: Categories for DHS clusters are: "Mig. Rate 0–25" for cluster with migration rate above 0 and below 26 percent, "Mig. Rate 26–50" for clusters with migration rate equal or greater than 26 percent and below or equal to 50 percent, and "Mig. Rate >50" for clusters with a migration rate above 50 percent. Clusters with no migration (i.e. the migration rate is 0) are excluded from the analysis.

Source: Author's own elaboration based on data from the Demographic Health Surveys (DHS) for selected countries.

Notes: Refer to the **Notes section** for full citations.

KEY DRIVERS OF YOUTH MIGRATION

Youth migration is driven by a complex and often intertwined array of factors at the individual, family, community, national and international level.[61] For many youth, migration is often a family strategy to diversify income and improve household welfare,[62] especially in contexts where state-provided welfare systems are absent or weak. In such cases, the decision to migrate is not made in isolation, and parents and elders may support youth migrants financially, with the expectation of future remittances.[63] When migration is a family strategy, it implies for youth balancing personal aspirations with familial obligations and expectations.

Youth migrate internally for various reasons, but primarily for marriage, education, employment and to join family members (Figure 2.16). Both young women and men often cite joining other family members as a primary reason for migration to both rural and urban areas. For young women, marriage and family reunification are the predominant reasons, especially for those migrating to rural areas. In Nepal, marriage accounts for nearly all female youth migration to both urban and rural areas, while in Cambodia and Kenya, employment is a leading driver of young women's migration to cities. For young men, education and employment are the primary drivers especially for rural to urban migration (Figure 2.16), reflecting the concentration of secondary schools in urban areas and the poorer quality of schools in rural areas.[64, 65] When youth migrate primarily for work or education, the process is rarely a single event and instead often involves a series of moves.[19, 66, 67] Youth may migrate for short or long periods, return home, stay temporarily and then migrate again. However, quantitative data capturing these multiple migration moves remain limited (see Box 2.4). These findings corroborate evidence[68, 69] showing that youth migration – particularly internal migration – is driven by reasons beyond immediate economic gains. Migration age profiles are strongly correlated with the age structure of life-course transitions such as education, entry into workforce and marriage, especially among women.[70] These transitions differ widely both within and across societies and are further shaped by social markers of differentiation including gender, class and Indigenous or ethnic identity.

The different motivations for internal migration have distinct implications for the relations between migrants and their families and communities of origin, as well as for the welfare and opportunities of young people. Youth migrating for education often require financial support instead of remitting money back home.[65] Even when migration is undertaken for employment, families often cover the initial costs,[71] and some migrants may stay with extended family members or close friends as they transition into the new life at their destination.[65, 66, 72, 73] In fact, youth migrants often remit less than migrants over 25 years old, in part because they need time to integrate into the host labour markets and begin earning higher wages.[74] Studies show that young people migrating for education often come from the wealthiest households, while those migrating for work have on average access to financial resources at a level similar to the rest of the population.[65]

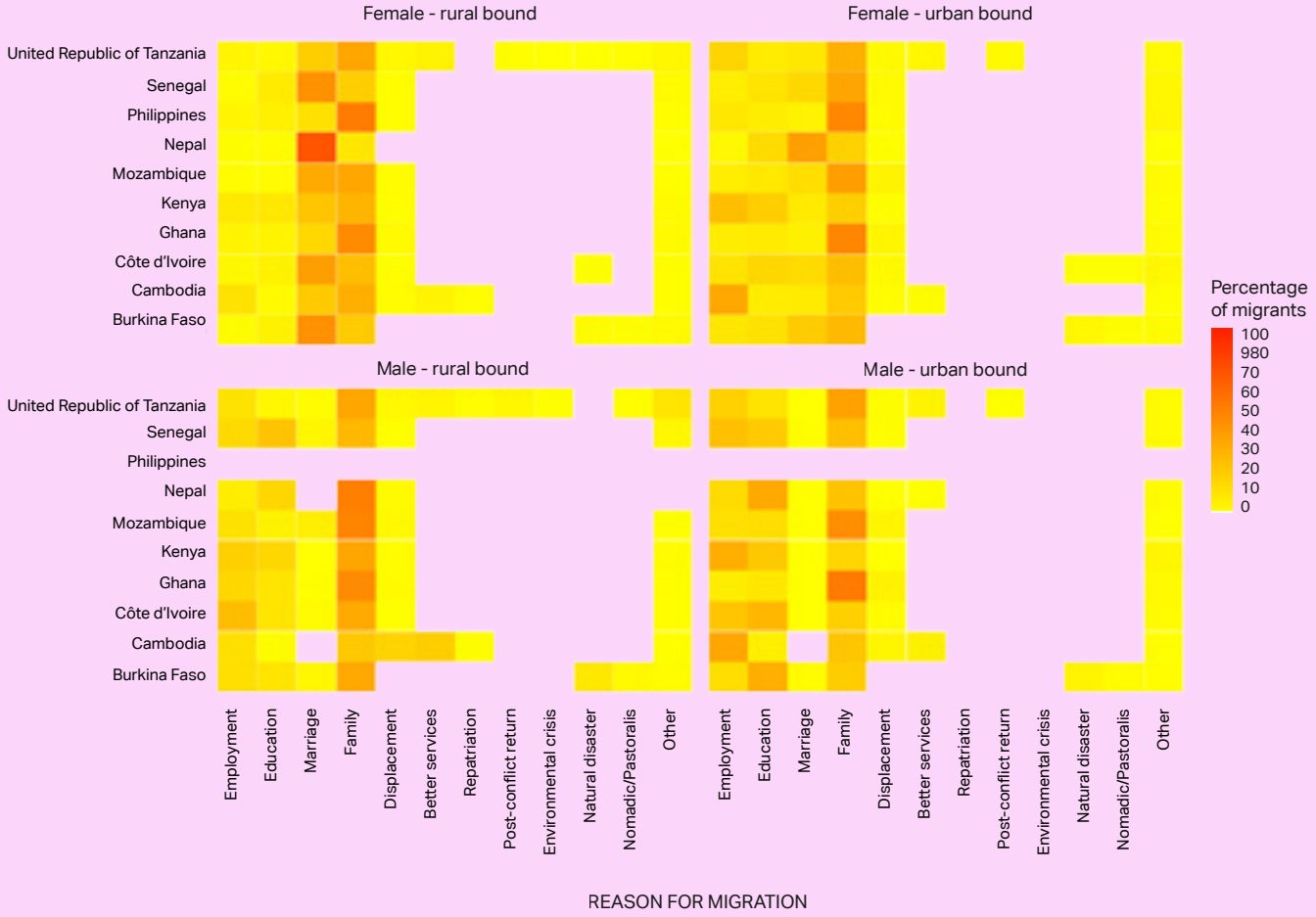
> "MIGRATION PATTERNS DIFFER BY GENDER. YOUNG WOMEN OFTEN MIGRATE FOR MARRIAGE OR FAMILY, YOUNG MEN FOR JOBS.

The nature of structural transformation and agrifood systems transition in a given context influences youth migration patterns. Urbanization, youth population growth, the local availability of off-farm work, and access to land and other productive assets all shape youth decisions to migrate. A study in Nigeria[41] found

> "YOUTH MIGRATION IS CLOSELY LINKED WITH LIFE TRANSITIONS LIKE WORK, EDUCATION AND MARRIAGE.

FIGURE 2.16

MARRIAGE AND FAMILY ARE KEY MIGRATION REASONS AMONG BOTH MALE AND FEMALE YOUTH, WHILE MALE YOUTH ARE MORE LIKELY TO MIGRATE FOR EMPLOYMENT



Source: Author's own elaboration based on data from Demographic Health Surveys (DHS) for selected countries with migration information.

that urbanization encourages youth migration, though the propensity to migrate differs depending on gender, education and ownership of assets. In general, women and better-educated youth are more likely to migrate to cities, while youth in households with livestock are less likely to do so. Owning land and physical assets is positively correlated with temporary migration, while larger landholdings deter permanent migration.[41] Other studies also point to access to land as an important determinant of youth migration. Larger than expected land inheritance significantly reduces the probability of both long-distance permanent migration and migration to urban areas in Ethiopia, particularly among male youth.[42]

For many young people, internal migration is often also a response to a lack of decent employment opportunities in rural areas. The prospect of better jobs, even within the informal economy, draws young people to cities.[75] Data from school-to-work transition surveys also highlight job satisfaction as a key motivation for migration, with strongly dissatisfied working rural youth more than

twice as likely to migrate as those who were satisfied with their jobs.[76] However, a study in Zambia[77] examining the role of rural vibrancy in youth migration decisions found that youth aged 15–24 were less influenced by local economic opportunities, including the availability of non-farm economic opportunities, than older individuals. While areas with greater agricultural productivity were associated with reduced rural out-migration, increased local non-farm economic activity seemed to have the opposite effect, increasing rural out-migration. However, these patterns are not observed among youth.[77]

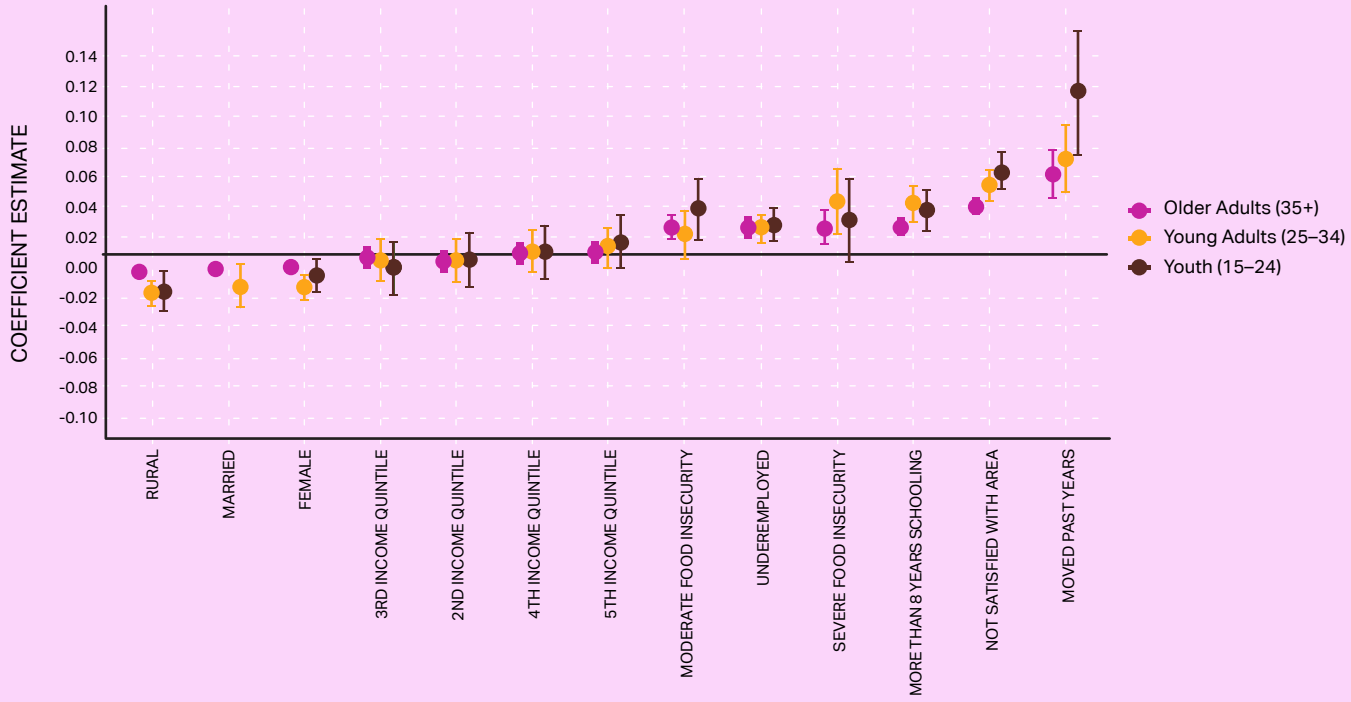
International migration, however, is more likely to be driven by economic reasons than internal migration. Unemployment and underemployment are strongly associated with intentions to migrate abroad, as shown in Figure 2.17, which illustrates key factors correlated with international migration plans among youth and adults. Youth planning to migrate internationally also tend to be better educated and are less likely to be female, married or living in rural areas (Figure 2.17).[78, 79] In Lebanon, youth from poorer backgrounds have a higher propensity to migrate, with unemployment and higher education levels increasing the likelihood.[80] In the European Union as well, youth with higher levels of education and those who are unemployed, particularly in countries with high youth-to-adult unemployment ratios, are more likely to have intentions to migrate.[79] Additionally, among youth who have migrated in the last five years, the likelihood of planning another move is higher, especially when experiencing dissatisfaction with living conditions in the local area.

Food insecurity also influences youth migration plans (Figure 2.17). Youth living in areas experiencing moderate food insecurity have a significantly higher probability of making plans to migrate abroad. According to figure 2.17, it is significant. Youth facing severe food insecurity may be trapped in situations of vulnerability.

© FAO/JEAN BAPTISTE NKURUNZIZA
IN RWANDA, A YOUNG FARMER PROUDLY HOLDS A CHICKEN RAISED ON A MODEL POULTRY FARM, PART OF A GROWING MOVEMENT EMPOWERING YOUTH WITH SKILLS AND INCOME THROUGH SUSTAINABLE EGG PRODUCTION.

FIGURE 2.17

MODERATE-TO-SEVERE FOOD INSECURITY INCREASES YOUTH'S PLANS TO MIGRATE INTERNATIONALLY, WHILE SEVERE FOOD INSECURITY HAS NO SIGNIFICANT EFFECT



Notes: The dependent variable is a binary indicator equal to 1 if the respondent intends to migrate within the next 12 months. The estimates are taken from a linear probability model with country fixed effects. The variables moderate food insecurity and severe food insecurity are measured at the sub-regional level. The variable underemployment is an indicator equal to 1 if the respondent is either unemployed or underemployed.

Source: Author's own elaboration based on individual-level survey data from the Gallup World Poll for 2015 for 131 countries.

YOUTH MIGRATION AND LABOUR SHORTAGES IN AGRIFOOD SYSTEMS

Youth migration can enhance livelihoods and incomes, while addressing labour shortages in agrifood systems. If well-managed, youth migration could fill critical labour gaps within agrifood value chains[3, 5] and revitalize rural areas in countries facing shrinking youth populations.

Global agrifood systems already rely heavily on both internal and international migrants. The COVID-19 pandemic demonstrated this dependence, as border closures and mobility restrictions led to severe labour shortages in many agricultural supply chains, especially those reliant on seasonal labour, with disruptions in production as well as the processing and distribution of food.[81] Temporary and seasonal migration – both within and across borders – is a longstanding characteristic of rural livelihoods, linked to seasonality of agriculture and household income diversification strategies (see Box 2.4). For instance, major agricultural exporters such as Brazil,[82] Chile[83] and Mexico[84] depend on internal migrants, often from Indigenous communities, to fulfil seasonal labour needs on commercial farms. In South Asia, internal migrants form a substantial portion of the workforce in aquaculture and fish processing industries in countries like Bangladesh and India.[85, 86]

For countries in the early or intermediate stages of agrifood system transition but with large youth populations, such as protracted crisis, traditional and expanding agrifood systems, migration can enhance youth economic prospects. Evidence from Peru demonstrates that temporary labour migration, whether to work within or outside agrifood systems, significantly improves the welfare of young migrants.[87] Temporary labour migration is a function of agricultural activities with different crop cycles, ensuring continuous employment throughout the year. While agriculture remains a key employer for youth migrating to rural areas, migration enables access to non-agricultural opportunities, particularly for youth moving to urban areas. A study in Ethiopia, Malawi, the United Republic of Tanzania and Uganda found that youth migration to urban areas facilitates entry into non-agricultural labour markets, whereas rural-to-rural migration primarily supports livelihood diversification within the agrifood sector.[88] This highlights how migration – whether to rural or urban areas – can help young people supplement their incomes and reduce dependence on a single economic activity, making them more resilient to economic and environmental shocks.

Migration also affects the agricultural activities and income of those who stay in the household. Studies in Ethiopia and Malawi demonstrated that youth migration affects rural households' labour allocation and decisions, with the labour endowment of migrants replaced by other members of the households or leading to an increase in hired labour.[2] The impact on household income varies by context; in Malawi, youth migration has been linked to reduced total household income, whereas in Ethiopia, it has led to higher net income.

In industrial agrifood systems, international migration is increasingly vital for addressing agricultural labour shortages caused by declining rural populations. Australia, Canada and the United States of America have long relied on migrant workers to sustain their agrifood industries.[89, 90] Similarly, Southern European nations like Greece, Italy and Spain are experiencing a growing dependence on migrant labour as local populations move away from agricultural work.[91] In Greece, for example, migrants now constitute a substantial share of the workforce in sheep, cattle and goat husbandry, reflecting broader trends in workforce restructuring.[92, 93]

Although youth constitute a large proportion of migrant agricultural workers, comprehensive statistics on their exact numbers remain scarce due to data aggregation practices. Migrant youth under 18 are often categorized alongside children in child labour studies, obscuring their specific contributions. Research indicates that youth under 18 can comprise 10 percent to 40 percent of migrant agricultural workers and 16 percent to 80 percent of child labour in specific agrifood value chains.[94] However, they often face precarious working conditions, including lower wages, longer working hours, reduced educational opportunities and higher occupational hazards compared to local youth.[95]

BOX 2.4 YOUTH TEMPORARY AND SEASONAL MIGRATION

Seasonal migration is a temporary form of migration in which individuals or entire families move during specific periods of the year, returning home afterwards. This movement can occur within national borders or across countries and is influenced primarily by agricultural calendars. In Senegal, mobile phone data tracking confirms spikes in seasonal rural-to-rural migration during agricultural harvest period.[i] Recent studies reveal trends of seasonal migration of young people during the rainy season, suggesting diverse income diversification strategies.[ii, iii] Seasonal migration tends to be more accessible for landless, low-income and marginalized groups, as well as youth, due to its lower skills requirement and fewer upfront financial costs.[iv, v] A study from India showed that individuals aged 16–40, particularly from scheduled tribes and castes, are overrepresented in short-term migration flows.[vi] In Benin, many young people from the Barienou district migrate annually to Nigeria to work in agriculture. Nearly half of migrants interviewed are aged between 18–27 years old, with primary-educated and married youth more engaged in farming activities.[vii] In Brazil, young men aged 17–30 years from rural areas with low-education and farming backgrounds are the predominant seasonal migrant workers in sugarcane mills.[viii] Similarly, in the Valle de Uco in Argentina, seasonal migrant workers are mostly young men aged 20–30.[ix] Youth also represent a large share of seasonal international migrant workers supporting agriculture, particularly in fruit and vegetable production within industrial agrifood systems.[x]

Seasonal migration presents both opportunities and challenges for youth. Seasonal migration to nearby areas allows youth, especially male youth, to return home for the farming season.[xi] This supports continued ties with family land while awaiting inheritance (see Chapter 3). Some youth also use seasonal migration to accumulate capital for future agricultural investments.[xii] However, seasonal migration can negatively impact youth health, social life and working conditions.[vii] For example, young men migrating to work on farms in Nigeria are often recruited by intermediaries and employed under precarious working conditions.[xiii] Likewise, in Ethiopia, many young people migrate to urban centres to work as daily labourers, particularly after the harvest season. Additionally, while seasonal migration serves as a vital coping mechanism for food insecure households or a supplemental livelihood strategy, it can also reduce agricultural yields due to labour shortages in sending areas, increase school dropouts and deepen social isolation.[xiv] Seasonal migration, whether undertaken by individual youth alone or alongside other adult family members, as seen in cotton harvesting in Pakistan[xv], can restrict access to education and healthcare, increase risks of child labour and ultimately undermine long-term human capital development [xvi] (see also **Chapter 3, Box 3.2**).

Temporary and seasonal migration also have gender patterns. In Benin, girls as young as 13 years migrate temporarily, with some seeking independence and/or escaping forced marriages. Many end up working in processing, street food or as domestic servants.[xiii] In Mali, temporary migration is increasing, particularly among unmarried girls in search of autonomy.[xvii] Similarly, in Tunisia, seasonal migration patterns have shifted over time, with rural young women increasingly engaged in short-term migration to work in textile factories, domestic labour or agriculture.[xviii]

When managed effectively, temporary and seasonal migration can be a "triple-win" – it can support migrants' livelihoods, alleviate labour shortages at destination areas, and contribute to economic development in origin communities through remittances and skill transfers. Bilateral labour migration agreements, seasonal agricultural migration schemes and entry quotas are some of the policy tools used to regulate this form of migration (see **Chapter 7**).

Despite its importance, seasonal migration remains poorly understood due to limited and inconsistent data.

Many seasonal migration movements go unrecorded due to the lack of standardized definitions and the short-term nature of these movements. Data are rarely disaggregated by age, making it difficult to analyse youth-specific trends. While Eurostat provides comparable seasonal migration data for European countries, similar initiatives are lacking in many other regions. Improved data collection is crucial for assessing the scale, trends and impacts of seasonal migration on migrants and agrifood systems.

Notes: Refer to the **Notes section** for full citations.

© FAO/TANG CHHIN
SOTHY – IN KAMPONG CHHNANG, CAMBODIA, CHHUM KIMSEAK, AGED 17, RIDES HER MOTORBIKE TO SCHOOL.

03 ACCESS TO ASSETS AND RESOURCES

© FAO/RUSSELL WAI
IN PAPUA NEW GUINEA, GIBSON AND GENO GABI STAND IN THEIR PLANTATION OF SWEET POTATOES.

KEY MESSAGES

- Rural youth, and especially young rural women, lag behind their urban counterparts in terms of social capital and formal and informal participation in policy and decision-making processes related to agrifood systems.
- Rural youth face significant disadvantages in accessing quality education and training opportunities, impacting their opportunities to secure decent work in agrifood systems. 74 percent of rural young people complete lower secondary education, compared with 85 percent of urban young people. These challenges are more severe in protracted crisis and traditional agrifood systems, both for young rural women and migrants.
- Fewer than half of young people own any land due to barriers such as delayed inheritance and rising land prices. These constraints, and others like limited access to capital, hinder young people, especially young women, who want to farm from accessing land and establishing independent livelihoods.
- There are significant gaps in the data and evidence regarding youth access to natural resources – such as forestry and fisheries – and assets like livestock. Case studies suggest that young people encounter challenges in accessing more valuable and capital-intensive livestock, such as dairy-producing animals, with the limited available data suggesting that youth and youth-led households have smaller livestock holdings than adults or households led by adults.
- Young people's inadequate access to inputs, machinery and technology reduces the propensity of youth to work in agrifood systems. Data from selected countries suggest that adult-headed households, as compared to those led by youth, enjoy greater uptake of and access to improved seeds, fertilizers and chemicals in the majority of countries.
- Youth are more digitally connected than adults, but disparities persist. 81.2 percent of youth use the internet, compared to 68.2 percent of adults, reflective of higher digital engagement among young people. However, digital access varies widely by agrifood system: 98.2 percent of youth use the internet in industrial agrifood systems, but only 33.9 percent in traditional agrifood systems. The digital gap between youth and adults decreases as agrifood systems transition from traditional to industrial, but youth in protracted crisis settings remain the most digitally excluded.

INTRODUCTION

Greater access to assets and resources is essential for the empowerment of young people, their economic independence and productive participation in agrifood systems. However, young people frequently face significant challenges in accessing resources due to generational and gendered power dynamics, as well as structural, economic, social and spatial constraints.[1] Policy and legal barriers may also impede access. Delayed access to farmland and other resources (e.g. fisheries or forestry rights) through inheritance means that many young people establish themselves as independent farmers only once they are no longer officially classified as youth, although their involvement in farming might have started earlier. For many young women, farming becomes a vocation only after marriage, and even then, they may not have independent access to land.[2]

There is a growing interest in understanding what motivates young people to pursue agrifood system livelihoods. Studies have sought to ascertain the role of different assets and resources in facilitating young peoples' access to livelihoods in agrifood systems, including whether access to knowledge and technology can offset negative perceptions of work in agriculture or agrifood system value chains. The reality is much more nuanced and suggests that decisions may also be driven by the presence of concrete opportunities, such as access to land or wage employment.

The literature on generational renewal of farming identifies different ways in which young people can enter farming: as newcomers to the agricultural sector, by moving directly from working on family farms to becoming independent farmers, or by returning after a period of time away for education or for work. For example, in rice-growing villages in Central Java, West Java and South Sulawesi, Indonesia, landlessness is widespread and less than half of farmers own the land they cultivate. Young people from smallholder families may inherit a small piece of land one day, likely when they are no longer young, while youth from landless and land-poor families opt for temporary migration or wage labour and sharecropping.[3]

Evidence also shows that the likelihood of embracing innovation is related less to age than to being a newcomer to the agricultural sector, which undermines the idea of technology and innovation as a silver bullet to motivate young people to remain in agriculture.[4] Intergenerational relations and interdependencies, including inheritance and the transfer of knowledge, can facilitate or hamper the generational renewal of agricultural labour, a process further complicated by the intersection with education, marriage and family formation.[2]

Contextual factors including social norms and policy environment also shape access to assets and resources. Young people continually renegotiate their position in society as well as in relation to assets, especially land. Within agrarian structures, young people exercise constrained agency, meaning they navigate, adapt to and sometimes challenge the limitations imposed by generational and gendered hierarchies. This concept acknowledges that while young people – especially young women – face structural barriers to accessing resources and decision-making power, they also find ways to negotiate space for autonomy within these constraints.

Following the conceptual framework outlined in Chapter 1, this chapter examines young people's access to the assets and resources that underpin agrifood systems livelihoods, highlighting the unique barriers they encounter due to their social position. Five broad categories of assets and resources are considered: social capital; human capital with a focus on education, training and skills; natural capital (land, livestock, forest

and fisheries resources); financial capital; and physical capital, including digital access, inputs and different types of technology and tools relevant for agrifood systems. All of these categories contribute to boosting young people's agency, defined as the ability to determine one's goals and act upon them, as discussed in Chapter 1.[5]

SOCIAL CAPITAL

Social capital refers to the networks, relationships and trust that connect people and help them work together to achieve common goals. These connections can open doors to resources, information and opportunities that young people need to succeed. It plays an important role in shaping how young people engage with and influence agrifood systems.[6] Social capital is a key component of building strong, sustainable rural communities.[7, 8] When combined with other factors, like good infrastructure and supportive institutions, social capital can help rural economies thrive.[9] At its core, social capital is about relationships – how they are formed, how they change and how they help communities adapt over time.[10]

There are two main types of social capital. Bonding social capital refers to strong connections within close groups, like family and friends. These ties create a sense of loyalty and trust, which helps people support one another.[10] Bridging social capital, on the other hand, connects people from different backgrounds or communities. This kind of social capital helps young people access new ideas, opportunities and resources beyond their immediate circle.[11]

In rural areas, both bonding and bridging social capital play an important role. Young people often rely on close networks of family and friends for emotional and practical support. At the same time, having connections outside of these circles – through schools, community organizations or agricultural cooperatives – can help them find new opportunities. For instance, a study of young farmers in Northern Greece revealed that social capital was generally low, with limited participation in voluntary organizations and low trust in institutions. This hindered their ability to engage in collective activities and access new resources. However, those with stronger trust in personal relationships, such as family and friends, were more likely to participate in collective efforts, highlighting the role of personal networks in compensating for weak institutional support.[12]

The relationship between agency – as defined in Chapter 1 – and social capital is dynamic. While networks play a key role in building social capital,[13] agency is essential to effectively mobilize and utilize this social capital.[14] Conversely, when social capital is weak – due to limited trust or poor institutional support – it can constrain youth agency, limiting their ability to participate meaningfully in agrifood systems. Youth who lack formal access to resources, such as land or credit, often rely on social capital to bridge these gaps, drawing on family ties, peer networks and community connections.

> "YOUTH WHO LACK FORMAL ACCESS TO RESOURCES, SUCH AS LAND OR CREDIT, OFTEN RELY ON SOCIAL CAPITAL TO BRIDGE THESE GAPS.

Collective action is an important means for youth to act as agents of change. Many young people are active participants in cooperatives, social movements and associations, to varying degrees across countries and typologies of agrifood systems.[16] Such collective processes can amplify the voice of young people as agents of change for agrifood systems transformation. Social capital focused on building relationships with peers and friends is particularly beneficial for youth when participating in associations and organizations, because they can acquire expertise and demonstrate the capacity to organize.[17] Case studies in settings as diverse as Canada, the Russian Federation and Thailand demonstrate that joining collective organizations can facilitate youth's access to natural resources, finance and markets,[16] whereas evidence from Uganda suggests that being part of rural organizations has helped young people overcome psychological, physical and economic barriers to improved rural livelihoods.[17]

> **"YOUTH OFTEN EXERT LITTLE INFLUENCE ON DECISION-MAKING IN GLOBAL FORUMS, INCLUDING ON AGRIFOOD SYSTEMS AND CLIMATE, DUE TO A LACK OF PARTICIPATION AND VOICE.**

Nonetheless, youth participation in collective action faces challenges. Young people have lower levels of experience and resources and may therefore experience greater difficulties in establishing, leading and holding rural organizations to account.[18,19] As suggested by Trivelli and Morel, living in a remote rural setting constitutes the first level in a "hierarchy of exclusion" which can intersect with numerous other characteristics of youth. Gender is considered a major exclusion factor that interacts with rurality reducing young women's opportunities for participation due to mobility constraints, lower literacy rates, persistent gender inequalities in the rural household and discriminatory social norms.[20] Rural youth in employment or education seem to be more likely to be politically or socially engaged than economically inactive youth.[21] Additionally, youth civic engagement is increasingly tied to the digital sphere, with the internet and social media expanding and redefining traditional civic spaces and forms of engagement, though lack of access to technology and digital literacy represent constraints for unconnected youth in remote rural settings.

Finally, youth often exert little influence on decision-making in global forums, including on agrifood systems and climate, due to a lack of participation and voice.[22] Research on the lived experiences of young participants in multilateral forums notes persistent barriers to meaningful youth engagement, including inadequate support for quality participation (e.g. lack of clarity regarding objectives, pre-participation training, financial and logistical support) and insufficient inclusivity and representation. Young delegates report tokenism and feeling exploited, and most are unable to attribute any social or policy impact to their participation in global forums.[23] Strategies and policies on youth are often written based on the request of donors or other development partners, rather than grassroots demand (see also Box 3.1).[24]

HUMAN CAPITAL

EDUCATION, TRAINING AND SKILLS

Education – including informal ways of acquiring knowledge and competencies – and training are essential for empowering youth to participate in a meaningful manner in agrifood systems, while also enabling them to strengthen their livelihoods. Without adequate skills and education, young people are more likely to be confined to low-quality jobs, perpetuating intergenerational cycles of poverty and inequality. Education is highly correlated with better wages and employment opportunities, both within and outside agrifood systems. In agriculture, education is significantly correlated with the adoption of improved technologies such as improved varieties, chemical inputs and mechanization, though the association with improved natural resource management innovations is more ambiguous.[25] Agricultural extension is most effective in areas with higher education levels, highlighting the complementarities between education and agricultural extension.[25]

©FAO/FANJAN COMBRINK IN CHEREPONI, NORTH-EAST REGION, GHANA, CHRISTABEL KWASI AND FELLOW YOUNG WOMEN FARMERS INSPECT A FONIO PROCESSING MACHINE THAT EFFICIENTLY SEPARATES THE CHAFF FROM THE GRAIN, EXEMPLIFYING YOUTH-LED INNOVATION IN LOCAL AGRIFOOD SYSTEMS.

BOX 3.1 YOUTH REPRESENTATION IN FORMAL POLITICAL PROCESSES

Youth are under-represented in formal political processes. Only 2.8 percent of parliamentarians worldwide are under 30, about one-third of whom are young women. The share of youth in single and lower chambers is 3.2 percent globally but is lower in Africa and Asia at 2.3 percent and 1.8 percent, respectively.[i] A combination of legal barriers (e.g. age and financial requirements for public office) and social norms undermines the active participation of young people, especially young women, in formal governance structures. For instance, African youth (aged 18–35) are less likely than older citizens to engage in change-making activities such as voting in elections, attending a community meeting or joining others to raise an issue, and are more likely to view government institutions and leaders as corrupt.[ii]

Mechanisms such as youth parliaments or national and local youth councils risk reinforcing social inequality by failing to achieve diversity and inclusion among their young constituents, particularly of the hard-to-reach majority.[iii–v] Such participation mechanisms tend to involve more educated, organized youth activists – high-performing and outspoken urban "elites" who do not necessarily represent the interests or share the experiences of their less educated or less socially engaged peers.[vi] Institutional participatory spaces dedicated to rural youth exist in a few countries, supported by the Ministry of Agriculture or local authorities. For instance, Chile's Mesa Nacional de Jóvenes Rurales is a consultative mechanism composed of 16 youth representing different local chapters, which in turn comprise hundreds of rural young people. This platform plays a role as a sounding board for national policies and programmes targeting young smallholder farmers and youth in rural areas, such as the national Rural Youth Policy.

Analysis of rural youth civic engagement and its determinants is minimal, particularly for low- and middle-income countries. However, young people in rural areas seem to be less likely to participate in political activity than their urban peers,[vii–ix] both offline and online.[x] In rural communities, traditional decision-making spaces are often dominated by older generations, and even when youth are included, they frequently lack the confidence, skills and resources necessary to effectively influence decision-making outcomes. Generational power dynamics create further resistance, with elders or community leaders reluctant to share authority. Institutional and local political systems often fail to provide inclusive platforms for youth participation, while economic pressures such as unemployment force many young people to focus on immediate survival rather than civic engagement. In some regions, political instability, violence and restrictive environments also make participation unsafe, further deterring youth from engaging in community processes.[xi]

Notes: Refer to the **Notes section** for full citations.

FORMAL EDUCATION

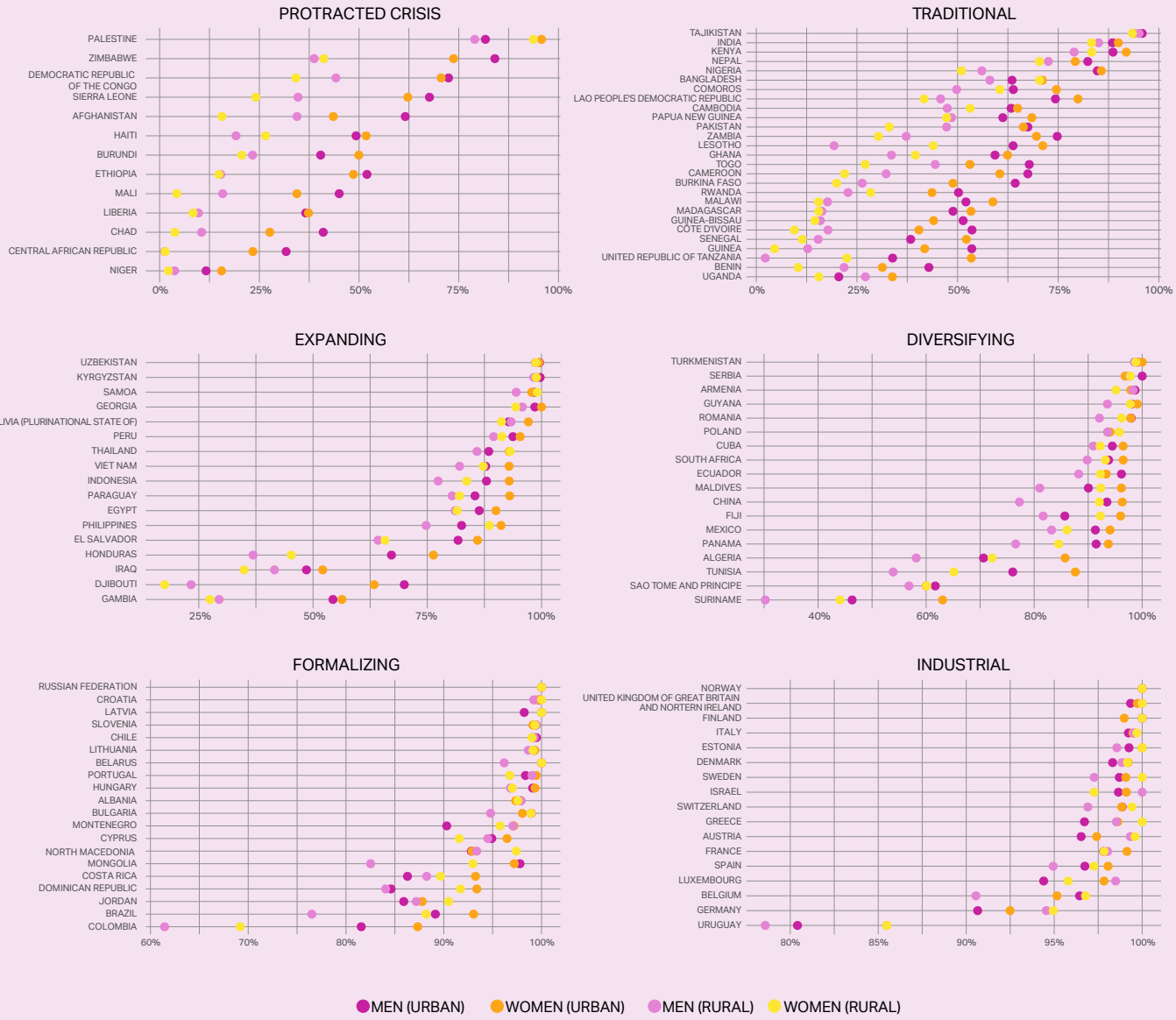
Despite significant improvements in education globally over the last several decades, rural youth continue to be disadvantaged in access to formal education compared with their urban peers. These disadvantages start with primary and lower secondary education, which are the foundational blocks for engaging in more advanced learning and better-paid work. Averaging across all types of agrifood systems, 74 percent of rural youth complete lower secondary education compared with 85 percent of their urban counterparts. Only 20.5 percent of rural girls in protracted crisis agrifood systems complete lower

> **ONLY 20.5 PERCENT OF RURAL GIRLS IN PROTRACTED CRISIS AGRIFOOD SYSTEMS COMPLETE LOWER SECONDARY EDUCATION.**

FIGURE 3.1

RURAL YOUTH ARE LESS LIKELY TO COMPLETE LOWER SECONDARY EDUCATION THAN URBAN YOUTH IN TRADITIONAL AND PROTRACTED CRISIS AGRIFOOD SYSTEMS

Completion rate (%) of lower secondary school for men and women in rural and urban areas, by agrifood system typology

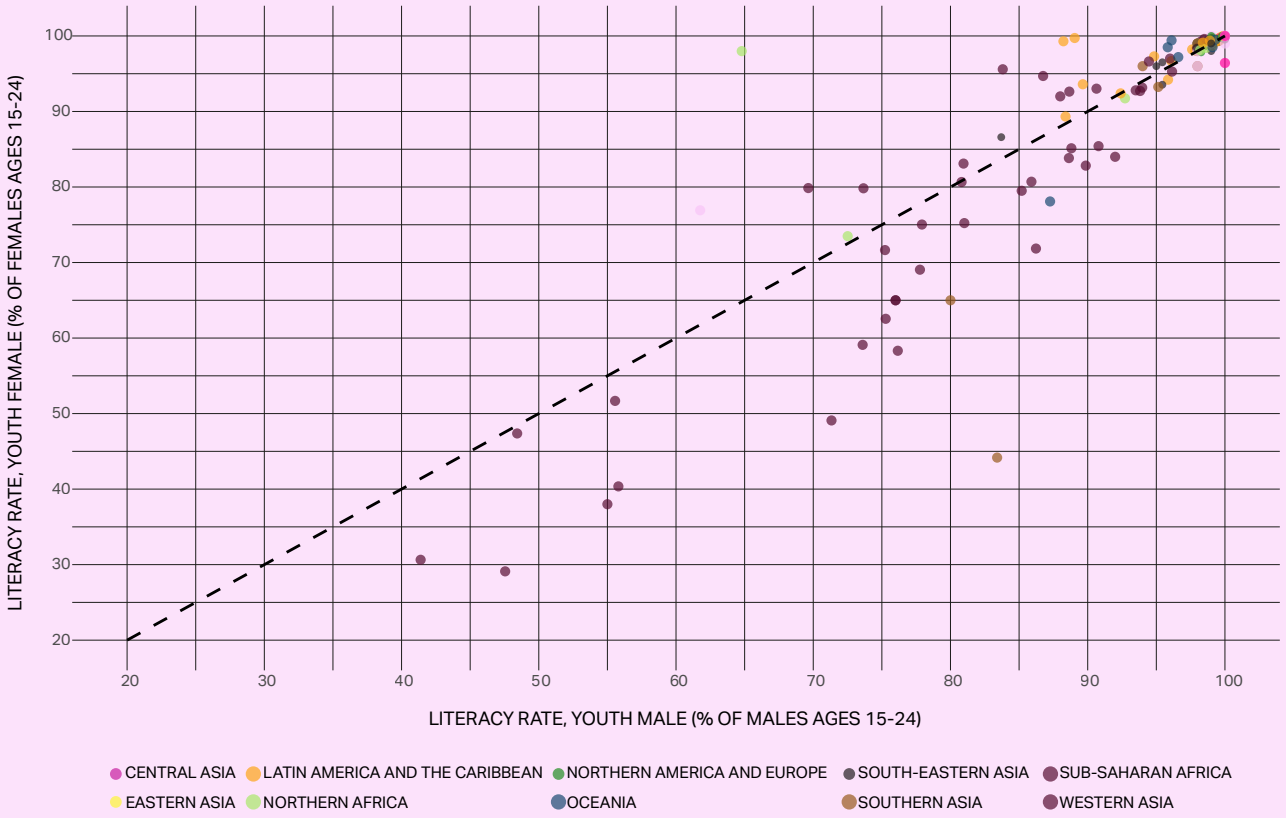


Source: Author's own elaboration based on data reported for SDG indicator 4.1.2 (Completion rate, lower secondary by sex and location) for 112 countries. The data – restricted to the latest available years – were downloaded from http://data.uis.unesco.org/index.aspx?queryid=3697 (28 November 2024). Three additional countries reported data on SDG 4.1.2, but an agrifood system classification is not available for these countries.

FIGURE 3.2

LOW YOUTH LITERACY RATES AND LARGE GENDER GAPS ARE OBSERVED IN MANY SUB-SAHARAN AFRICAN COUNTRIES

Literacy rates (%), young men vs young women, aged 15–24, by region



Source: Author's own elaboration using data from UNESCO Institute for Statistics (UIS). UIS. Stat Bulk Data Download Service. Processed by World Bank Gender Data Portal, https://genderdata.worldbank.org/en/indicators, accessed 11 March 2025. The most recent year available can vary from 2015 (e.g. Nicaragua) to 2023 (e.g. Azerbaijan).

secondary education, compared with over 50 percent of their male and female peers in urban areas, and with 98 percent of girls in industrial agrifood systems. In Central African Republic, Chad, Liberia, Mali and the Niger, less than 10 percent of rural girls complete lower secondary education (Figure 3.1).

While marked rural–urban gaps in education are also evident in the case of traditional food systems, the gap in lower secondary education is smaller in expanding and diversifying agrifood systems, though some exceptions are visible, notably in Djibouti, the Gambia, Honduras and Iraq. In diversifying food systems, rural girls not only outpace boys in completing lower secondary education, they also reach almost the same level as urban girls. Rural–urban and gender gaps disappear in industrial agrifood systems. Young migrants also face challenges in accessing education (see Box 3.2).

> **LITERACY AND NUMERACY SKILLS OFTEN REMAIN ALARMINGLY LOW EVEN AMONG THOSE WHO ATTEND SCHOOL.**

Between 2000 and 2022, the youth literacy rate increased from 87 percent to 93 percent, globally.[26] However, literacy and numeracy skills often remain alarmingly low even among those who attend school. Low literacy and numeracy have been identified as binding constraints on competitiveness across sub-Saharan Africa, leading to low-quality jobs and persistent poverty and inequality.[27] Among young men and women aged 15–24 in sub-Saharan Africa, 21.4 percent lack basic literacy skills,[26] with literacy skills also low in several countries in South Asia and North Africa (Figure 3.2).

© FAO/ALISA SUWANRUMPHA
IN NORTHEASTERN THAILAND, NOOPHEEN MEKAWAN, MARKETING SECRETARY OF THE BAAN HUAI BONG FISH PROCESSING GROUP, SHARES HER STORY DURING AN INTERVIEW AT THEIR 'ONE' BRAND SHOP IN NONG BUA LAM PHU.

BOX 3.2 EDUCATION AND TRAINING OF YOUNG MIGRANTS, REFUGEES AND INTERNALLY DISPLACED PERSONS (IDPS)

Internal and international youth migrants face a number of specific barriers to education and training. Residence requirements, a need for documentation (or even perceived need) or the threat of deportation can keep children and youth from enrolling in school. Young seasonal migrants and/or the children of seasonal migrant workers may also face additional barriers including incompatibility of school calendars, admission timing, the expectation that they will work with their families, and the location of agricultural work in remote areas where schools may not be present or transportation unavailable.

Despite the challenges, migration to towns, cities or abroad can increase access to education compared to availability in the area of origin. Many youth migrate from rural to urban areas for secondary or tertiary education. In OECD countries, immigrant youth often achieve better educational outcomes compared to peers who remained in their country of origin.[i] However, their outcomes tend to lag behind those of native-born peers, with the gaps shrinking for the second generation[i] and largely disappearing by the third.[ii] The age of migration can also affect education outcomes: for example, among Mexican immigrants to the United States of America, those who arrived between the ages of 0 and 6 years have an educational advantage compared to their peers who do not migrate and those that migrate in the later years of childhood.[iii]

Children and youth left behind in migrant-sending households

Migration from rural areas can also positively or negatively impact the education of children and youth who are left behind. Receiving remittances from migrant household members can pay for school fees and related costs and help their households respond to shocks, allowing them to continue their education. A study using data from 122 developing countries from 1990 to 2015 found that remittances had a positive effect on school enrolment and completion rates, and that investment in girls' education increased more than in boys'.[iv] Conversely, children/youth may withdraw from school (or be pulled out) to compensate for the labour of relative(s) who have migrated. Such youth experience increased risks of mental health concerns including depression and anxiety, and worse nutritional outcomes compared with the children of non-migrants.[v, vi]

Young refugees and IDPs

Displacement poses serious challenges for the education of young people. An estimated 40 percent of the forcibly displaced population are under 18, totalling 47 million children.[vii] Nearly half of school-aged refugees are out of school, with persistent gender disparities. [vi] Some 66 percent of refugees are in protracted situations; low- and middle-income countries host 71 percent of the refugee population, globally, with least developed countries (LDCs) accounting for 22 percent.[vii] Displacement can cause large influxes of children and youth in a short period of time, necessitating urgent action and the allocation of considerable resources. In remote and rural areas, key challenges include the need for parallel systems to educate displaced students, a lack of recognition of previous degrees or courses, teacher shortages, slow recruitment processes, language barriers, trauma, insufficient psychosocial support, teachers without adequate training to deal with displaced populations, social tensions, and prolonged detention or transit zones without access to education while applications are processed.[viii]

Notes: Refer to the **Notes section** for full citations.

At the global level, the gender gap in literacy stood at 2 percentage points in favour of men, but is significantly larger in many countries in sub-Saharan Africa and South Asia.[28] For example, in Pakistan 65 percent of young women were literate in 2019 compared with 80 percent of young men, while in Afghanistan only 44 percent of female youth were literate in 2022 compared with 83 percent of male youth (Figure 3.2). In the Central African Republic and Chad, less than one in three young women are literate.

Numeracy skills often lag even further behind literacy skills. In a sample of 13 sub-Saharan African countries, the proportion of children aged 7–14 with foundational numeracy skills[b] ranges from less than 1 percent to approximately 36 percent for both boys and girls.[28] Limited access to resources, digital technology and skilled teachers exacerbates the situation in rural areas.[29] School curricula and textbooks may downgrade farming as an occupation, marginalizing agriculture in young people's aspirations, contributing to the deskilling of youth and their unpreparedness for life in transforming rural areas.[30–32] For instance, almost no mention of pastoralism is made in Kenya's educational curriculum.[33]

VOCATIONAL EDUCATION AND TRAINING

In many low- and middle-income countries, even students who attend school often leave without the skills required for better remunerated on- and off-farm jobs, creating a disconnect between education and local labour market demand. Technical and vocational education and training (TVET) – with its focus on practical, work-related skills, such as how to process and package food, or training on the cultivation of new or specific varieties of crops – is often promoted to help address skills gaps and increase the employment opportunities of both youth and adults. However, participation in TVET remains limited. Globally, only 13.6 percent of youth (aged 15–24) have completed vocational education, a proportion that decreases to 9 percent in Africa.[34] Youth from marginalized groups may face significant barriers to accessing vocational training.

©FAO/THAN RATHANY
IN SVAY LUR, CAMBODIA, A WOMAN FARMER HARVESTS VEGETABLES.

b If the child succeeds in 1) number reading, 2) number discrimination, 3) addition and 4) pattern recognition, s/he is considered to have foundational numeracy skills. https://data.unicef.org/resources/dataset/learning-and-skills

A systematic review based on 37 studies from India found that despite government efforts, participation of youth from tribal communities in vocational training remained low.[35]

In both TVET and general education, the socioemotional and problem-solving skills needed for successful youth employment, along with necessary advanced cognitive and technical skills, are not being taught.[36–38] Employers highlight the absence of socioemotional skills as the primary reason for their reluctance to hire recent graduates.[36] Teaching non-cognitive (soft) skills is likely to be a low-cost investment with high returns, as discussed in Chapter 7.[39, 40]

However, access to education and training is not sufficient to ensure a match between the skills and training youth receive and those needed for employment. As Fox and Ghandi note, "Africa has both an over-skilling and under-skilling problem",[39] which can result in large shares of youth in low- and middle-income countries reporting unemployment or lack of use of their skills. In a sample of eight sub-Saharan African countries, 47 percent of employed youth were overqualified for their jobs, while 28 percent were underqualified,[41] pointing to the existence of substantial labour market frictions (see also Chapter 4).

Learning goes beyond formal schooling.[42] This is particularly important for rural youth who tend to be disadvantaged in access to quality formal education.[30, 32] In rural areas, especially in agriculture, knowledge is often passed down from older to younger generations, starting early as children help on the farm. However, in rapidly evolving contexts shaped by factors such as economic development and improved access to education, young people spend less time at home with family and elders, engaging in traditional agricultural activities. On the other hand, young farmers increasingly aspire to adopt modern, technology-driven agricultural practices.[43,44] Agricultural extension systems can play a vital role in filling this gap, providing access to information and cutting-edge technologies.

AGRICULTURAL EXTENSION AND ADVISORY SERVICES

Agricultural extension and advisory services are integral to equipping those working in agrifood systems with the knowledge and skills necessary for achieving sustainable production. They can take many forms including access to information, financial services, digital platform and marketing support, designed to meet a wide array of objectives beyond productivity gains.[45]

Recent studies highlight a modest level of youth participation in agricultural extension and advisory services. In Pakistan, researchers found that youth participation in extension programmes plays a critical role in disseminating essential knowledge, promoting sustainable agricultural practices and adopting climate-smart techniques, equipping young farmers with valuable skills and bridging traditional agricultural practices with modern climate adaptation strategies.[46] Participation in Farmer Field Schools (FFSs) and other institutional initiatives was also minimal, with disparities observed between male and female youth in case studies from Ethiopia and Nigeria.[47,48] Increasing attention has been paid to targeting youth as both recipients and providers of extension and advisory services,[49] though understanding of how to effectively engage youth in extension and advisory services remains limited.

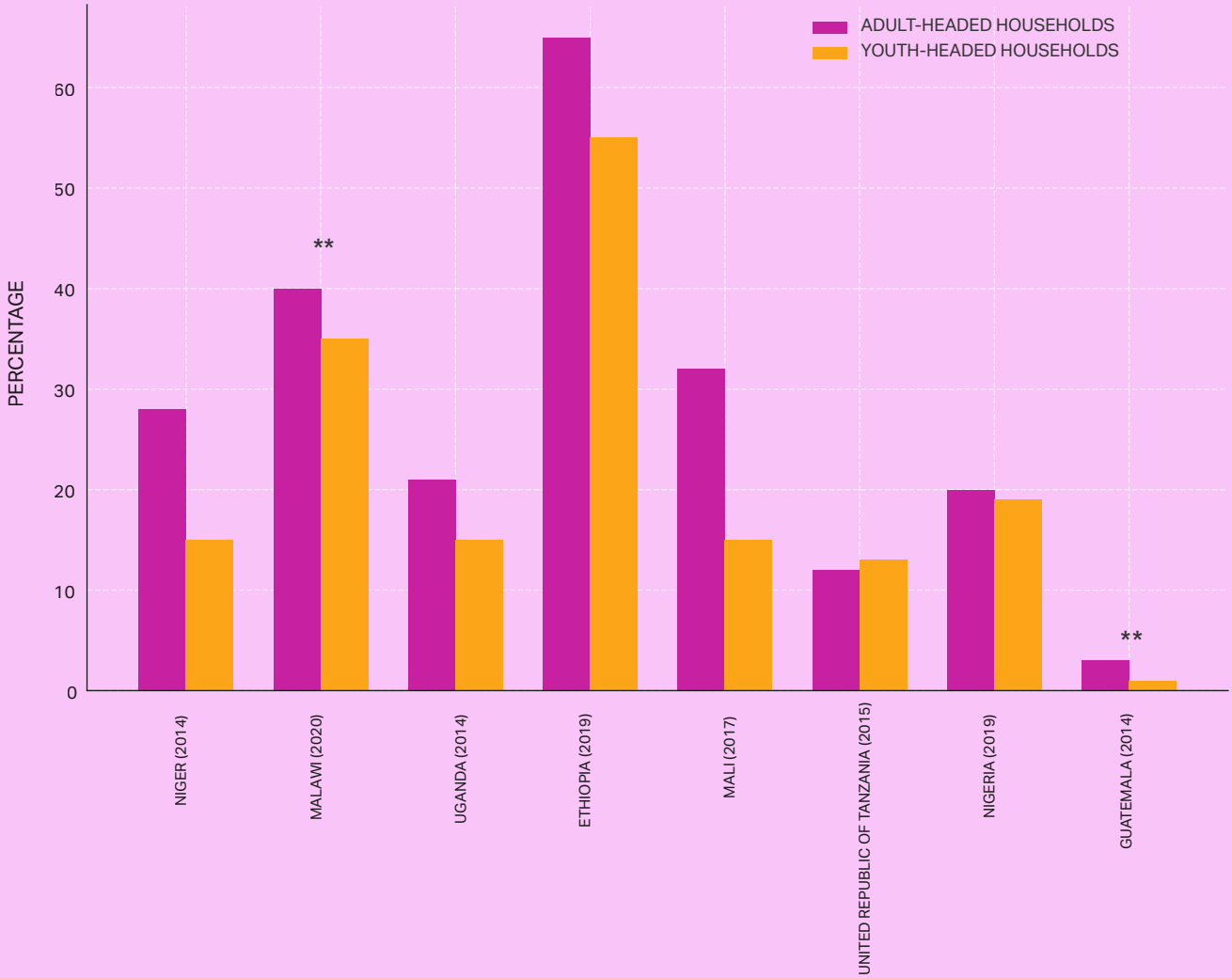
Young men and women are often disadvantaged because extension systems tend to target the household head, who are likely to be mostly older men. Information on access to extension continues to be collected mainly at the household level, resulting in significant gaps in information at the individual level. Even when youth are the head of the household (see Box 3.3), they tend to be disadvantaged in access to extension, as evidenced in Figure 3.3, which shows data from seven sub-Saharan African countries and Guatemala.

RECENT STUDIES HIGHLIGHT A MODEST LEVEL OF YOUTH PARTICIPATION IN AGRICULTURAL EXTENSION AND ADVISORY SERVICES.

FIGURE 3.3

YOUTH HOUSEHOLD HEADS ARE LESS LIKELY TO HAVE ACCESS TO EXTENSION SERVICES

Share of farming households with access to extension services, comparing households led by young farmers with households led by older farmers, selected countries



Note: The share of youth-led households (out of all households) across the sample of countries is less than 5 percent, but it varies from 0.18 percent in Georgia to 7.7 percent in Malawi. The number after each country name refers to the year of the survey.
Countries ordered by increasing level of per capita GDP. Farming households only. Youth = 15–24. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

Source: Author's own elaboration based on data from FAO. 2024. RuLIS – Rural Livelihoods Information System. In: FAO. Rome. [Cited 5 December 2024]. "http://www.fao.org/in-action/rural-livelihoods-dataset-rulis/en" www.fao.org/in-action/rural-livelihoods-dataset-rulis/en

BOX 3.3 YOUTH-HEADED HOUSEHOLDS

The majority of young people aged 15–24 live in households with their parents and depend on their families for their survival and livelihoods. Data from the ILO's School-to-Work Transitions Surveys, conducted in 34 developing countries across four regions between 2012 and 2016, show that while most young people are still dependent on their parents at age 15, with 80 percent identifying themselves as sons or daughters, this proportion falls to 45 percent by age 24. During this transitional period, the majority of young people are single, living at home and sometimes still studying and/or working in the family business. By age 25, those who are heads of household or spouses outnumber those still considered dependants, although in some countries they may continue to live in the same extended household. By age 29, most young people are assuming adult responsibilities, such as managing their civil status, livelihoods, and family and household duties, including parenthood.[i]

The proportion of young people with children also increases with age. At age 15, very few report having children, but by age 20, this proportion rises to nearly 20 percent, and by age 25, about 35 percent of young men have children. The trend is more pronounced among women: over 60 percent of young women have children by age 25. This difference is due to the fact that women tend to marry and have children earlier than men. The transition to parenthood, especially if unplanned, has a significant impact on labour market outcomes. Those with children tend to leave school earlier and have higher rates of not in education, employment or training (NEET), with the impact being more pronounced for young mothers.[i]

Households headed by younger people, including children and orphans, are particularly common in contexts affected by conflict, epidemics, family disruption and poverty. In these situations, older siblings often assume caregiving roles in the absence of adults. Leading such households poses unique challenges that affect both the psychosocial well-being and socioeconomic conditions of young people. Youth heads experience high levels of depression and social isolation, which hinder their ability to care for dependants,[ii] affecting in turn the development of younger family members.[iii] In South Africa, older orphans often drop out of school early to support their families.[iv] The lack of adult guidance also impacts the educational attainment of youth heads who struggle to balance caregiving and schooling.[v] Because young heads lack the resources and skills to effectively manage needs, these households are more likely to face food insecurity and economic vulnerability.[vi] Factors such as land rights and inheritance, which are shaped by legal and social norms that do not favour youth, also affect the sustainability of youth-headed households, limiting their ability to generate income and secure a stable livelihood.[vii]

Gender dynamics in youth-headed households affect decision-making and the distribution of resources. Young heads, especially women, often face challenges related to autonomy in decision-making, including on health-related behaviour due to the weight of gender norms and practices and access to education, which are critical to improving their economic situation.[viii] Evidence shows that higher educational attainment improves the welfare of these households, leading to better health and economic stability.[ix,x]

Notes: Refer to the **Notes section** for full citations.

Important complementarities exist between extension services and education. Extension has been found to be most effective in areas with high levels of education, and less effective where education is low.[25] Innovative approaches within extension systems may be needed to overcome the constraints to extension imposed by poor education. Non-traditional approaches – peer-to-peer learning, participatory approaches and practice-based learning on the job or in the field – can supplement the gaps left by the formal education system and extension and advisory services (EAS).

Different models are emerging to include youth in agripreneurship schemes. For example, in Rwanda and Uganda, multiple models have been identified that can support youth engagement in training and entrepreneurship in agrifood systems.[49] Models which focused on fee-based service provision by youth as village agents proved more successful. Such models empower youth to operate as entrepreneurial service providers, incentivizing their involvement through financial gains, while meeting the needs of their communities and simultaneously creating localized, sustainable systems for delivering agricultural services.

> “
>
> **OVER 20 PERCENT OF YOUNG PEOPLE GLOBALLY WERE NOT IN EDUCATION, EMPLOYMENT OR TRAINING (NEET) IN 2023.**

> “
>
> **IN 2023, WOMEN ACCOUNTED FOR TWO-THIRDS OF YOUTH CLASSIFIED AS NEET.**

YOUTH NOT IN EMPLOYMENT, EDUCATION OR TRAINING (NEET)

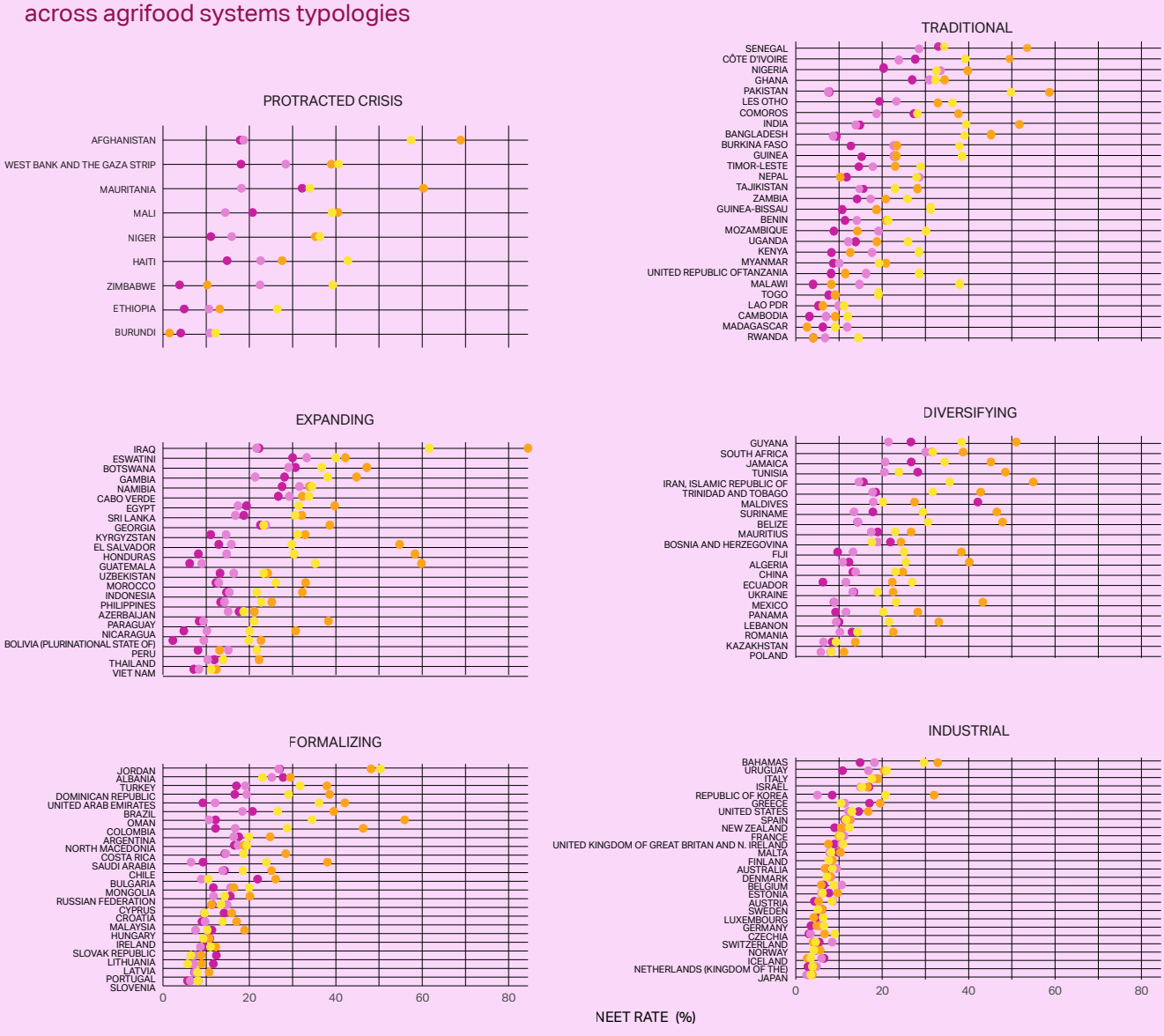
Over 20 percent of young people globally were not in education, employment or training (NEET) in 2023.[50] Young people categorized as NEET are a highly diverse group facing different constraints and needs in terms of support for effective integration into the labour market. This diversity extends to their vulnerability to social and economic exclusion.

A larger share of young women than young men are NEET. In 2023, women accounted for two-thirds of youth classified as NEET.[50] In South Asia, the NEET rate among young women was 42.4 percent, nearly four times higher than that of young men.[50] Figure 3.4 shows the share of young men and women categorized as NEET across agrifood system transition types. A large share of youth in countries in protracted crisis are defined as NEET, though there is substantial variation across countries and by gender. Young women are more likely to be NEET across the whole sample, with gender gaps disappearing only in industrial systems. Rural young women are significantly more likely to be NEET than their urban counterparts in agrifood systems that are expanding, diversifying and formalizing. However, they are less likely to be NEET in contexts of protracted crises and have similar NEET rates to urban young women in traditional agrifood systems. Young migrant women, particularly those who have migrated to rural areas, are the most likely to fall into the NEET category. For young women, being classified as NEET during youth often results in cumulative disadvantages throughout their lives, reducing their likelihood of employment in later years.

FIGURE 3.4

YOUNG PEOPLE ARE OFTEN OUTSIDE EMPLOYMENT, EDUCATION OR TRAINING, PARTICULARLY YOUNG WOMEN

Share of youth not in education, employment or training (NEET) by sex across agrifood systems typologies



Source: International Labour Organization. 2020. "Labour Force Statistics database (LFS)". ILOSTAT. https://ilostat.ilo.org/data. Share of youth not in employment, education or training (NEET) by sex and rural/urban areas(%), ILO modelled estimates, November 2020. Unweighted means.

Greater unpaid and domestic care responsibilities keep young women in NEET, particularly in low- and middle-income countries. Data from 126 countries showed most young women of NEET status were not seeking employment for personal reasons, such as illness, disability, pregnancy, caring for young children or family restrictions.[50] In many countries, a large share of young women (20–24 years old) are married before they turn 18, which often results in the end of education and the start of childbearing as well as increased household responsibilities. Early marriage is most common in countries with lower levels of GDP per capita, particularly in sub-Saharan Africa followed by South Asia. Recent research, however, highlights a high prevalence in Latin America and the Caribbean, where one in four girls are married before they are 18 years old.[51,52] Poverty, restrictive gender norms, traditional beliefs and gender-based violence are key risk factors which increase the probability of early marriage.[51]

Climate change and other shocks are expected to exacerbate these challenges (see also Chapter 6). In Uganda, a negative rainfall shock led to a decline in female enrolment rates, particularly among older girls, and a decrease in female test scores, while having no significant impact on the outcomes for boys or younger girls.[53] In Bangladesh, years with moderate to severe heat waves (or the following year) see a higher proportion of girls married early or forced to marry.[54] The COVID-19 pandemic had similar impacts: in Honduras and Uganda, increased domestic and care burdens during the pandemic disproportionately decreased girls' attendance of school compared to boys,[55] conforming to broader global trends where the number of girls who dropped out of school for reasons other than closures were 1.2 times higher than that of boys.[56]

NATURAL CAPITAL: LAND, LIVESTOCK AND FISHERIES

LAND

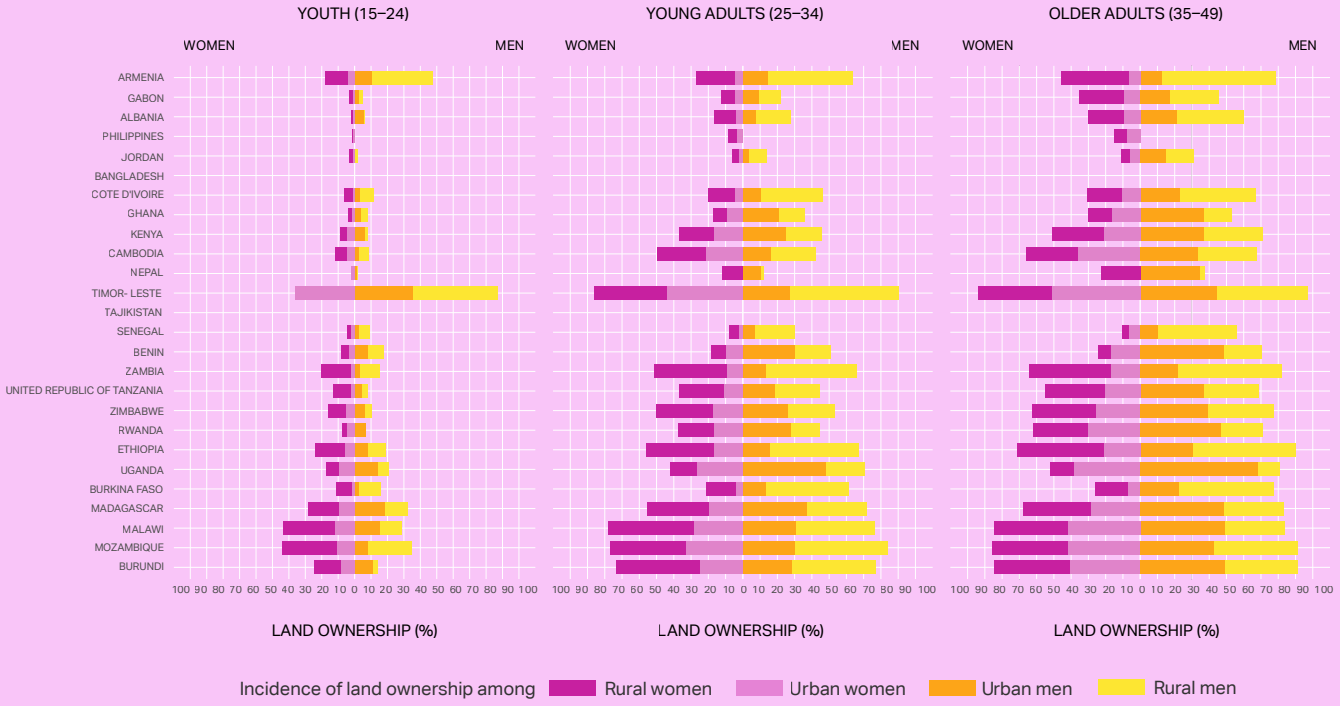
Farming requires land. An extensive body of literature points to land access and secure rights over land as key factors influencing young people's engagement in agriculture in low- and middle-income countries.[29,57,58] For example, a lack of access to land, rather than a lack of interest in agriculture, drives Indonesian youth's aspirations away from agricultural livelihoods.[59] In Ethiopia, larger than expected land inheritance increased employment in agriculture, reduced employment in the non-agricultural sector and reduced the likelihood of permanent migration among Ethiopian rural youth.[60] Similar patterns were documented in Nigeria,[61] suggesting that improving access to land can open-up opportunities for youth in agriculture.

> **"FEW YOUNG PEOPLE OWN ANY AGRICULTURAL OR NON-AGRICULTURAL LAND.**

FIGURE 3.5

FEW YOUNG PEOPLE OWN ANY LAND

Land ownership by sex, age and location



Notes: The figures show self-reported ownership of any agricultural or non-agricultural land, excluding housing. Left-hand bars show land ownership among women; right-hand bars show land ownership among men, across three age groups—Youth (15–24), Young Adults (25–34), and Adults (35–49)—in rural and urban areas. In Nepal, for Young Adult Women and Older Adult Women please note that the share of rural and urban landowners is almost identical, thus the darker color represents both groups. The male individual module was not implemented in Bangladesh, the Philippines and Tajikistan. The countries are arranged by GDP per capita (PPP), ranked from lowest (bottom) to highest (top).

Source: Author's calculations based on data from 26 Demographic and Health Surveys (DHS), www.dhsprogram.com/data

Across a sample of 26 countries, few young people own any agricultural or non-agricultural land (Figure 3.5). Timor-Leste is notable for high land ownership among rural youth – over 75 percent of rural young women and 85 percent of young rural men own some land. On the other end of the spectrum are Jordan and Nepal where less than 5 percent of both young men and women, rural and urban, own any land. Land ownership increases with age in all countries. This rise continues until aging adults begin transferring land through sales or bequests to the next generation, at which point it declines.[62, 63] Given age-related data limitations (women over 49 are not surveyed in Demographic and Health Surveys [DHS]), this trend is not visible in Figure 3.5; however, in higher-income countries, the land area owned by older people increased over time, while transfers of land happened later in life.[63,64] This could be linked to a lack of successor, difficulty selling the farmland or other socioeconomic constraints that hinder generational renewal in agriculture (see Spotlight 1.1). In many countries, youth aged 15 to 17 may not be legally permitted to own land independently until they reach the legal age of adulthood. In some

cases, land may be held in trust until they come of age, while in others, minors may be allowed to own land under specific conditions, such as inheritance. Land ownership laws vary by country, and youth land ownership statistics should be interpreted with these legal considerations in mind.

Land ownership is more common among rural young people than their urban peers. A rural–urban land gap is evident across all age cohorts, reflecting the greater reliance of rural populations on land for their livelihoods. The low incidence of land ownership among rural youth is not surprising; many rural young people work on family farms (see Chapter 4), and they may not be given independent plots of land until later in life or upon marriage. Marked gender inequalities in land ownership exist for all ages but are more pronounced for older age cohorts.

Young people who want to farm face constraints to accessing land. In many contexts, particularly in sub-Saharan Africa and parts of Asia, a smaller share of young people are inheriting land due to increasing land scarcity, and those who inherit land, tend to receive it later in life as life expectancy increases.[65] In Ethiopia, young people are less likely than their parents' generation to be able to access land independently, resulting in different patterns of land acquisition and livelihoods.[66] A large number of rural youth grow up without any prospect of inheriting land because their parents operate small plots of land, or are landless or tenant farmers.[67–69] At the same time, the nature of structural transformation in many low-income economies offers young people limited off-farm opportunities.

Elders and parents may delay transferring land to young people to retain control and secure their own livelihoods in old age. Land is often the only safety net available in rural areas,[66] and aging farmers may delay such transfers until they can no longer work the land.[70] This hinders youth from building independent livelihoods, fuelling frustration and conflicts.[71] Delayed access to farmland through inheritance means that many young people establish themselves as independent farmers when they are no longer young, although their engagement in farming might have started much earlier.[2] The tension between young people's desire to receive land and the desire of older generations to maintain control over their land represents a serious challenge in many rural contexts, including those with customary land systems.[72] A case study from Acholi subregion in Uganda, where land is held under customary tenure and is considered to be scarce, revealed that the elders were concerned about transferring land to youth because they feared it would be sold, jeopardizing their old-age livelihood.[73] Such fears are exacerbated in the context of land scarcity linked to population growth, urbanization and land degradation, and competing land uses between the expansion of monocrop plantations, tourism development and conservation efforts, as observed in some countries in Southeast Asia.[58, 74, 75] In many countries, the promised benefits of plantations have failed to materialize, especially for young people, both in terms of the number and quality of jobs created.[76]

Where land sales are formally forbidden, such as in Ethiopia[77] and in customary tenure systems, inheritance is one of the few viable pathways for young people to access land.[72] Data from 30 countries on ownership of the main property, which is often a home, show that among both male and female land-owning youth in rural and urban areas, inheritance is by far the main mode of land acquisition (Figure 3.6). The role of inheritance reduces with age as other modes of land acquisition like land purchases increase. Land purchases are less common in rural areas compared to urban areas.

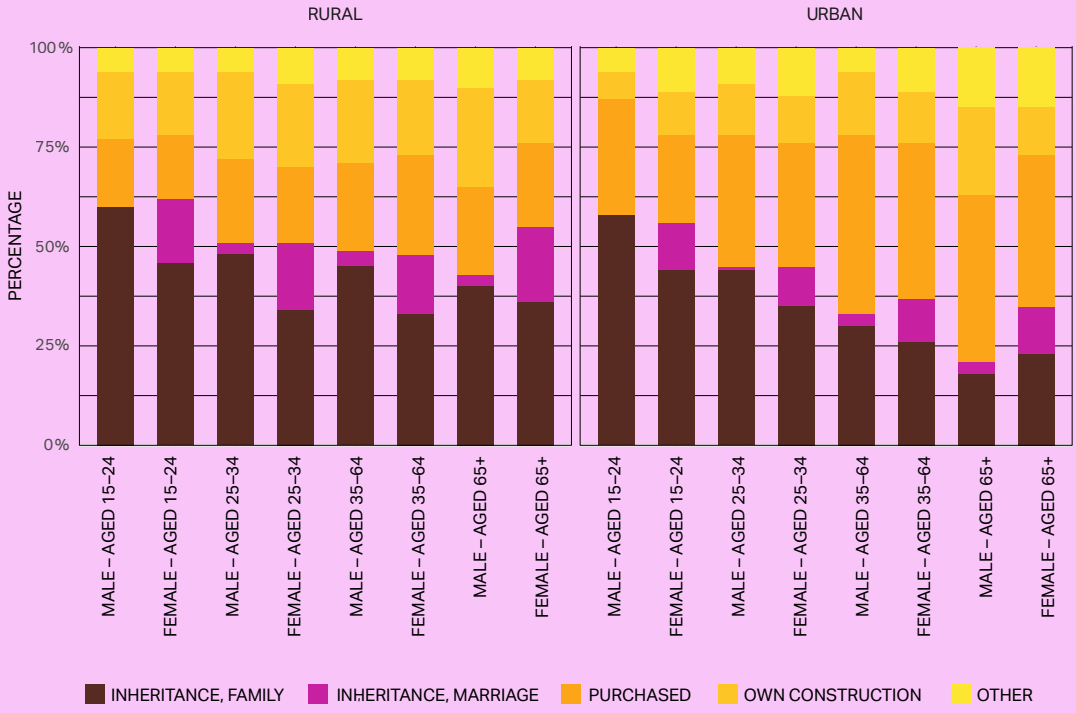
> **"INTERGENERATIONAL TENSIONS OVER LAND ACCESS POSE A SIGNIFICANT CHALLENGE IN MANY RURAL AREAS.**

© ALEX WEBB/MAGNUM PHOTOS FOR FAO
IN NUEVO SONORA, MEXICO, YOUNG WOMEN PREPARE FOOD FOR A VILLAGE MEAL.

FIGURE 3.6

YOUNG PEOPLE, BOTH MEN AND WOMEN, ACQUIRE LAND MAINLY THROUGH INHERITANCE

Mode of land acquisition among landowners, by age group and gender



Note: The statistics do not differentiate between residential, agricultural and other land.

Source: Author's own elaboration based on Prindex (2020) data for 30 countries with information on types of land acquisition.

Patriarchal customs and laws often favour men in inheritance, amplifying the barriers to land access for young women. Young men and women tend to have different expectations of inheritance. For example, while 40 percent of Burundian young men expect to inherit land, only 17 percent of young women hold this expectation.[67] Female youth are also less likely than male youth to inherit property from their family but may become landowners through marriage (Figure 3.6). Their access, however, is mediated by gendered power dynamics and patriarchal norms, and their land rights to the property can be lost upon divorce or spousal death.[78]

Even when equality in inheritance is safeguarded under the law, local norms and traditions may discourage women from claiming their rights. For example, evidence from India suggests that while women's and girls' inheritance rights are protected by law and registered on the land record, male siblings took over the inherited land.[79] Women tend to relinquish their share of inherited land in favour of their brothers to help them build their independent livelihoods, but also to secure their support or because of social pressure.[79, 80] In Kenya, married daughters are refused inheritance to prevent the transfer of land outside their natal holdings and into the husband's.[81]

For young people, rising land prices, limited savings and restricted access to credit are key obstacles to purchasing land. The growth of plantations, extractive industries and residential developments tend to fuel increasing land prices, impeding young people's access to land.[29, 72, 76] Community elders and parents may also hold onto land to profit from increased land values brought about by commercial agriculture interests and urbanization.[72] Using data from 36 countries at different levels of structural and rural transformation stages, Heckert *et al*. [82] found that rural transformation – proxied by agriculture value added per worker – is associated with reduced likelihood of landownership among both young men and young women, which may be due to increasing land values, increased commercialization of agricultural production, land consolidation and/or migration. The study also showed that higher levels of structural transformation – proxied by the share of GDP from non-agriculture – are associated with a higher likelihood of landownership for young men, but not young women.[82]

Renting is becoming an important channel through which young people can gain access to land. A larger share of younger household heads rent land than older heads.[65] Based on evidence from Canada, China, India and Indonesia, Srinivasan and White (2024) find that most young people are landless and start farming on rented land, even if their parents own land. The only exceptions are youth from land-rich families and those orphaned at a young age.[2] A study in Northern Ethiopia similarly found that land rental markets can enhance access to land for landless and land-poor youth.[77] However, the study also revealed that male youth, particularly those who owned oxen, were more likely to benefit from these opportunities. Most rental contracts were under a share-cropping arrangements rather than fixed-cash payment, suggesting the existence of financial barriers or risks considerations that influence the willingness and ability of youth to engage in rental markets. In Indonesia too, youth perceived renting land for fixed-cash payment as risky and lamented the increasing scarcity of sharecropping opportunities.[83]

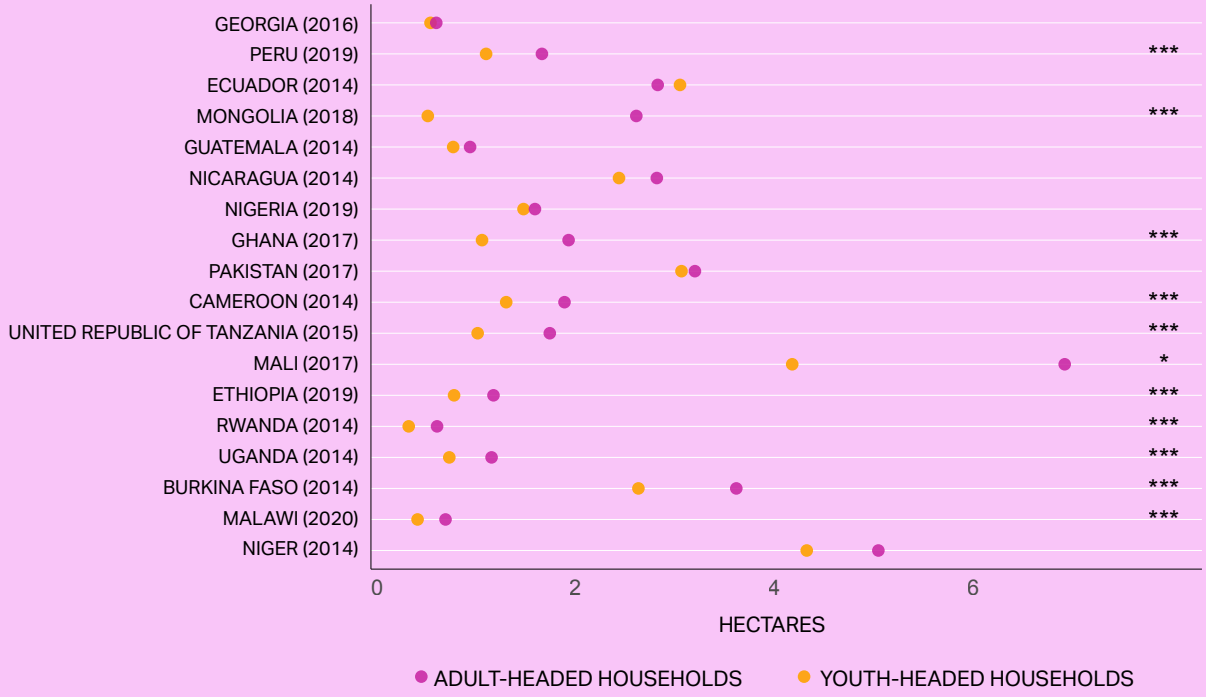
Moreover, when young people can access land, they are often restricted to small plots, which limit their ability to generate a decent income. Households headed by a young adult generally operate smaller farms (see Figure 3.7) compared to older headed households, suggesting that farm expansion and land accumulation often occur progressively over the course of an individual's life. In a case study from a customary tenure regime in Ghana, over three-quarters of youth respondents expressed dissatisfaction with their land sizes, citing concerns that the plots were too small to sustain viable livelihoods.[72] Similar findings are reported in southern Ethiopia.[57] In Ghana, young women were only able to access significantly smaller plots.[72]

©FAO/JAVID GURBANOV IN TOVUZ, AZERBAIJAN, A BENEFICIARY OF THE WOMEN'S EMPOWERMENT PROJECT AND TWO YOUNG MEN STAND IN A WHEAT FIELD, CLOSELY EXAMINING THE WHEAT HEADS.

FIGURE 3.7

YOUNG FARMERS GENERALLY OPERATE SMALLER FARMS

Average farm size of households led by youth farmers compared to older farmers



Note: Countries are ordered by GDP per capita. The share of youth-led households (out of all households) across the sample of countries is less than 5 percent but varies from 0.18 percent in Georgia to 7.7 percent in Malawi. *** p<0.01, **p <0.05, * p<0.10.

Source: Author's own elaboration based on data from FAO. 2024. RuLIS – Rural Livelihoods Information System. In: FAO. Rome. [Cited 5 December 2024]. www.fao.org/in-action/rural-livelihoods-dataset-rulis/en

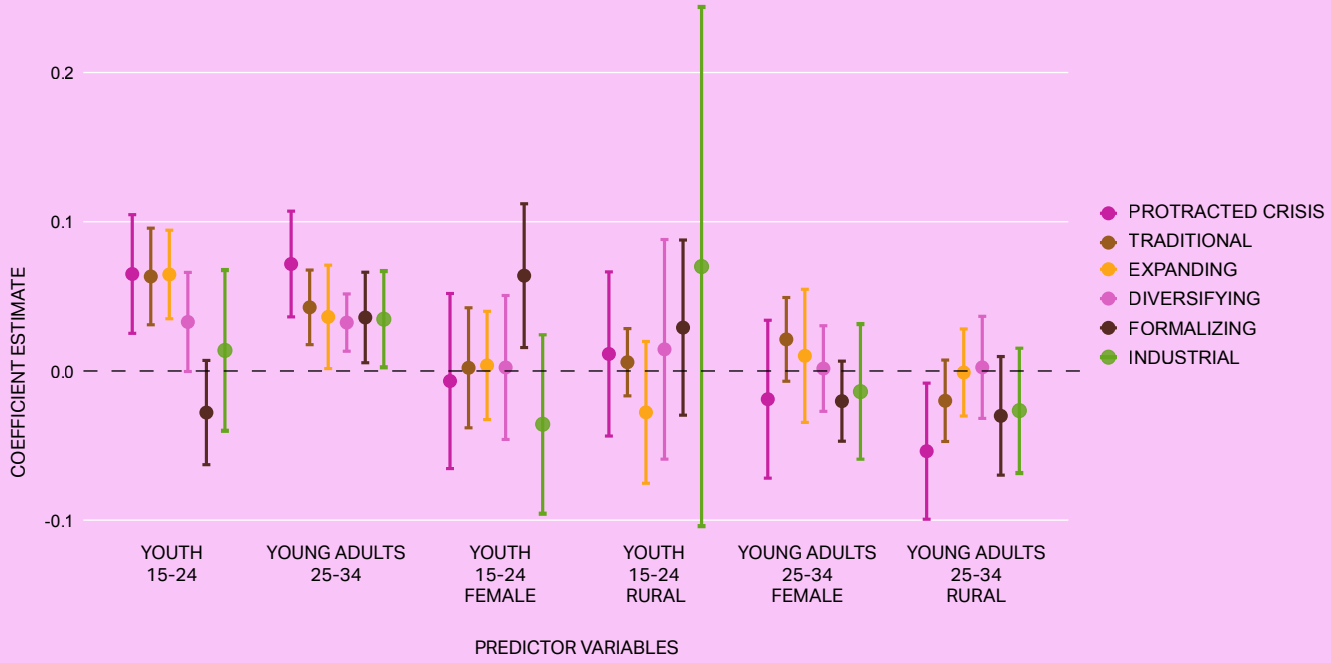
Additionally, young people are more likely to experience tenure insecurity. Youth landowners (aged 15–24) and young adult owners (aged 25–34) experience significantly greater tenure insecurity compared to landowners over 35 years old, with variation across agrifood systems (Figure 3.8). Specifically, youth and young adults encounter significantly higher tenure insecurity than adults aged over 35 in protracted crisis, traditional and expanding agrifood systems, while youth who own land do not experience notably higher tenure insecurity than adults in formalizing and industrial agrifood systems. The lower tenure insecurity among youth (aged 15–24) compared with young adults (aged 25–34) in industrial and formalizing agrifood systems may reflect the longer time youth spend in schooling and their continued financial dependence on their parents in these systems. As they transition into employment, they begin to experience tenure insecurity, closely linked to financial and job instability in early career stages. Youth in rural areas are not any more tenure insecure than their urban counterparts. Female youth also do not report higher perceptions of tenure insecurity than male youth except in formalizing agrifoods systems.

Youth voices are largely excluded from discussions on land matters, at all levels, including land reforms and large-scale land sales. Qualitative research from several countries and large-scale land acquisition cases reveals that young people often express frustration that land negotiations are dominated by local chiefs and government officials, with some input

FIGURE 3.8

YOUNG PEOPLE ARE MORE LIKELY TO EXPERIENCE TENURE INSECURITY

Percentage of adults who feel insecure about their property, by age group



Note: The figure shows the coefficients from a linear probability model. The dependent variable is a binary variable equal to 1 if the individual reported feeling tenure insecure. The base category is older adults aged 35 and above. Other controls include education, marital status, household size, country and year fixed effects. The sample includes 126 485 observations and was created by pooling two waves of Prindex data – 2018/19 and 2024 –restricted to land/property owners (i.e. excluding renters and individuals using a property with or without permission).

Source: Author's own elaboration based on Prindex data downloaded from: www.prindex.net/data, accessed 12 November 2024.

from their parents, while youth are rarely included.[84, 85] However, youth should not always be viewed as vulnerable or excluded from land matters. Local context matters. For example, post-conflict contexts, marked by weakened institutions, often provide opportunities to restructure power dynamics over land, including in customary land systems. In a case study from Northern Uganda, Kobusingye [86] found that war strengthened the power of young men to assert their claims over land, often undermining the influence of elders and traditional authorities.

FORESTS

Forests provide an important source of livelihood for many young people, especially in the Global South, in addition to supplying ecosystems services and biodiversity.

There is ample evidence of the role that forests and trees play in alleviating poverty,[87, 88] particularly for forest-dependent and forest-dwelling groups, such as Indigenous Peoples, by providing safety nets and helping households cope with shocks.[89, 90] Globally, 75 percent of the rural population live within 1 km of forests and depend on them for food, fuel, income and culture. Tenure rights, however, are often insecure, with over 70 percent of forest areas under state ownership.[91, 92]

Systematic data on young people's involvement in the forestry sector are scarce. However, case studies suggest that young people's participation in community forestry and conservation can provide an alternative livelihood option.[93] A study in Cameroon found that both young men and women relied to varying degrees on livelihoods strategies which integrated agriculture with a range of forest-based activities, including agroforestry, shifting cultivation and the collection of non-timber forest products (NTFP) and firewood. Even young people who relied on non-forest related sources of income, including wage employment, still depended on forests for food and NTFP.[94]

Access to and use of forests may be mediated by gender and age differences and inequalities. Among the Karen Indigenous Peoples of Southern Myanmar, who practise a combination of shifting cultivation and cash cropping, young men are involved in clearing and burning forest areas, while young women plant rice and vegetables and gather fruits and herbs for food and medicine as part of their domestic chores.[95]

Overall, there is growing recognition of the need to involve young people in forest management, especially through community forestry and within Indigenous Peoples' communities.[93, 96, 97] This trend has been reinforced by the increasing participation and visibility of young people in global environmental activism.[98–100] However, meaningful participation in forest and community governance can represent a serious challenge for young people,[101–103] as intergenerational power and gender dynamics hamper young people's, particularly young women's, contribution to decision-making and governance. In their research in Mexico, Robson *et al*. found that young people wanted more say in community decision-making and that young women in particular felt marginalized and unrepresented, explaining that all the decisions were made by men.[96, 104] Similarly, a review of community forest governance in Cameroon found that youth felt excluded from local community management and complained that those in positions of authority were not open to democratic selection process. This eventually led to conflict between young people and adults in the Kongo community.[105]

Young people from communities that depend on forests, including Indigenous Peoples, often prefer to settle in their communities, if opportunities permit. However, the need for education or better livelihood options leads many young people to migrate. At the same time, studies indicate that many who leave also hope to and choose to return.[95, 96, 104] For example, evidence from Indigenous Peoples communities

> **SYSTEMATIC DATA ON YOUNG PEOPLE'S INVOLVEMENT IN THE FORESTRY SECTOR ARE SCARCE.**

in Myanmar shows a strong link between communities' physical, cultural and spiritual connection to nature and the forest and young people's desire to stay or return to their community and contribute to its development.[95] Similarly, a study conducted among Mapuche Indigenous communities in the Chilean Andes identified limited access to and daily interaction with forests as a cause of children's and adolescents' limited knowledge of forest resources. It also played a role in their migration away from the communities for education and their growing feelings of disconnection from traditional practices and the land.[106]

However, this relationship is being challenged by increasingly limited access to forests as a result of land acquisitions, a decrease in forested areas on people's farms and deforestation.[106] Although the latest data suggest that the rate of global deforestation is slowing, 47 million ha of primary forests was lost between 2000 and 2020, with agricultural expansion driving much of land-use change.[92, 107]

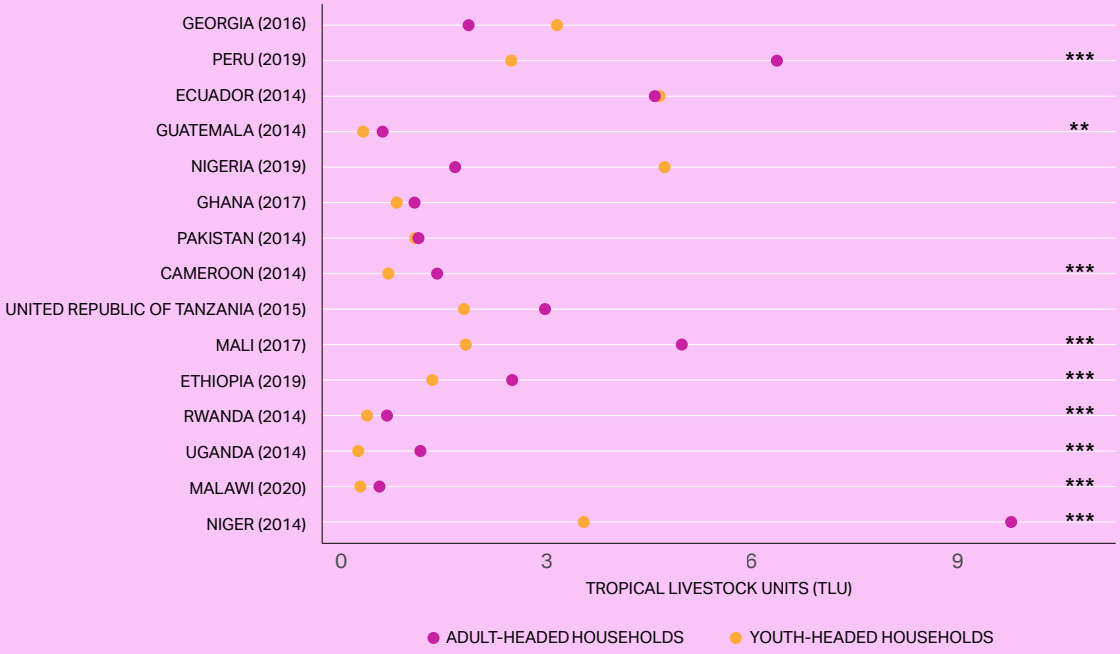
LIVESTOCK

Limited skills, knowledge, land and financial resources, coupled with inadequate policy support, create significant barriers to young people's involvement in the livestock sector, though it remains crucial for the livelihoods of many young people in agrifood systems.[108] National age and sex-disaggregated statistics on individual's livestock ownership are scarce, making it difficult to estimate young people's participation in livestock production and their access to livestock as an asset. Case studies suggest that young people encounter challenges in accessing livestock that are considered more valuable and capital-intensive, such as dairy-producing animals.[109] As a result, youth-led households have smaller livestock holdings

FIGURE 3.9

IN MOST COUNTRIES, YOUTH-HEADED HOUSEHOLDS ARE LESS LIKELY TO OWN LIVESTOCK

Average number of tropical livestock units owned by households led by youth compared to older farmers



Note: Countries are ordered by GDP per capita. *** p<0.01, **p <0.05, * p<0.10.

Source: Author's own elaboration based on data from FAO. 2024. RuLIS – Rural Livelihoods Information System. In: FAO. Rome. [Cited 5 December 2024]. www.fao.org/in-action/rural-livelihoods-dataset-rulis/en

than households led by older adults (Figure 3.9). This is not surprising given youth's lower access to capital and land.

Young people access livestock through inheritance, purchases, gifting and loaning, as well as through the reproduction of animals already owned.[110] Livestock acquisition and ownership patterns may be strongly gendered. In Kenya, livestock is mostly inherited by sons. While the inheritance of livestock by girls is unusual and against prevailing norms,[110] both men and women may receive livestock as rewards for achievements, and girls may be given livestock to mark important life events such as marriage and the birth of a child.[110] However, even when young brides receive such gifts, control over the livestock may reside with the groom. Women often have easier access to and control over small ruminants and poultry, which provide them with an opportunity to earn an income that they can control and an asset that can be sold in the event of shocks.[111–113]

Cambodia, Ethiopia, Malawi and the United Republic of Tanzania are among the few countries to collect national, individual-level data on livestock ownership that can be disaggregated by both age and gender, as shown in Figure 3.10. Three elements are apparent from these data. First, a lower share of youth in all countries own each type of livestock, as compared to older adults. Second, young men are more likely than young women to own large livestock in the United Republic of Tanzania, while the opposite is true in Cambodia and Ethiopia. In rural Ethiopia, 26 percent of female rural youth compared with 17 percent of male rural youth own large livestock, either solely or jointly, while among older adults, 80 percent of adult men and 56 percent of adult women own livestock.

The data are consistent with findings in the literature suggesting that access to livestock in Ethiopia is affected by gender, age, marital status, ethnicity and class, and that women's perceptions of ownership may change as they age.[114] Third, in all countries young women are more likely to own poultry compared to young men. In Cambodia, 30 percent of rural young women (aged 18–24) own some poultry, compared with 17 percent of rural young men.

Norms around youth's ownership and control over livestock, and their participation in livestock value chains can evolve. For example, in Ethiopia, there is evidence that young women are increasingly able to control income which comes from the sale of sheep and goat products (e.g. cheese and butter), and that young people are working in wage positions in small-ruminant value chains, reducing the importance of owning larger animals.[115,116] In addition, newer strategies are being adopted to facilitate young people's access to livestock. For example, a study in Baringo County in Kenya found that young women acquired cattle, sheep and goats through participation in rotating savings groups.[110] However, among pastoralist youth in Ethiopia, membership in local savings organizations, which seemed a promising approach to enable young people to acquire livestock, was limited by lack of income and social capital.[117]

FISHERIES AND AQUACULTURE

A review by WorldFish on aquaculture and small-scale fisheries highlights the fact that young workers, particularly young women, dominate employment in the fisheries sector.[118] A global survey of aquaculture farms found that most workers were between 20 and 39 years old.[119] Similarly, a study on predominantly female workers in shrimp processing factories in Bangladesh reported that 60 percent of workers in the Chittagong region were between 18 and 25 years old.[120] In Nepal's Terai region, a project introducing carp-prawn polyculture technology to small-scale women farmers found that 58 percent of participants were between 20 and 39 years old.[121] Meanwhile, in small-scale fisheries, women-led artisanal and invertebrate fishing activities in Al Wusta Governorate of Oman were carried out primarily by those aged 21 to 30, accounting for 34 percent of participants.[122]

However, youth participation in fisheries and aquaculture is shaped by skills and asset gaps that limit their ability to engage fully in these value chains. While globally comparable data on youth participation in fisheries are not available, case studies show that ownership of, control over and access to assets and technologies influence the propensity of young people to engage in fisheries and aquaculture value chains. Such asset gaps are similar to those that influence the likelihood of youth taking up crop farming. Nets, boats and land for aquaculture are often transferred intergenerationally, over time, reducing access by youth.[123] Additionally, in Kenya significant skills gaps limit young people's participation in the more profitable parts of fish value chains.[124] Meanwhile, in the Ugandan catfish industry, a recent study by FAO demonstrates that young people are under-represented in all aspects of the value chain, though better represented in fish processing, a highly feminized segment.[125] Youth need to overcome the above-mentioned asset and knowledge gaps in order to capitalize on government incentives in fisheries and aquaculture value chains, as shown in a case study on Nigeria.[123]

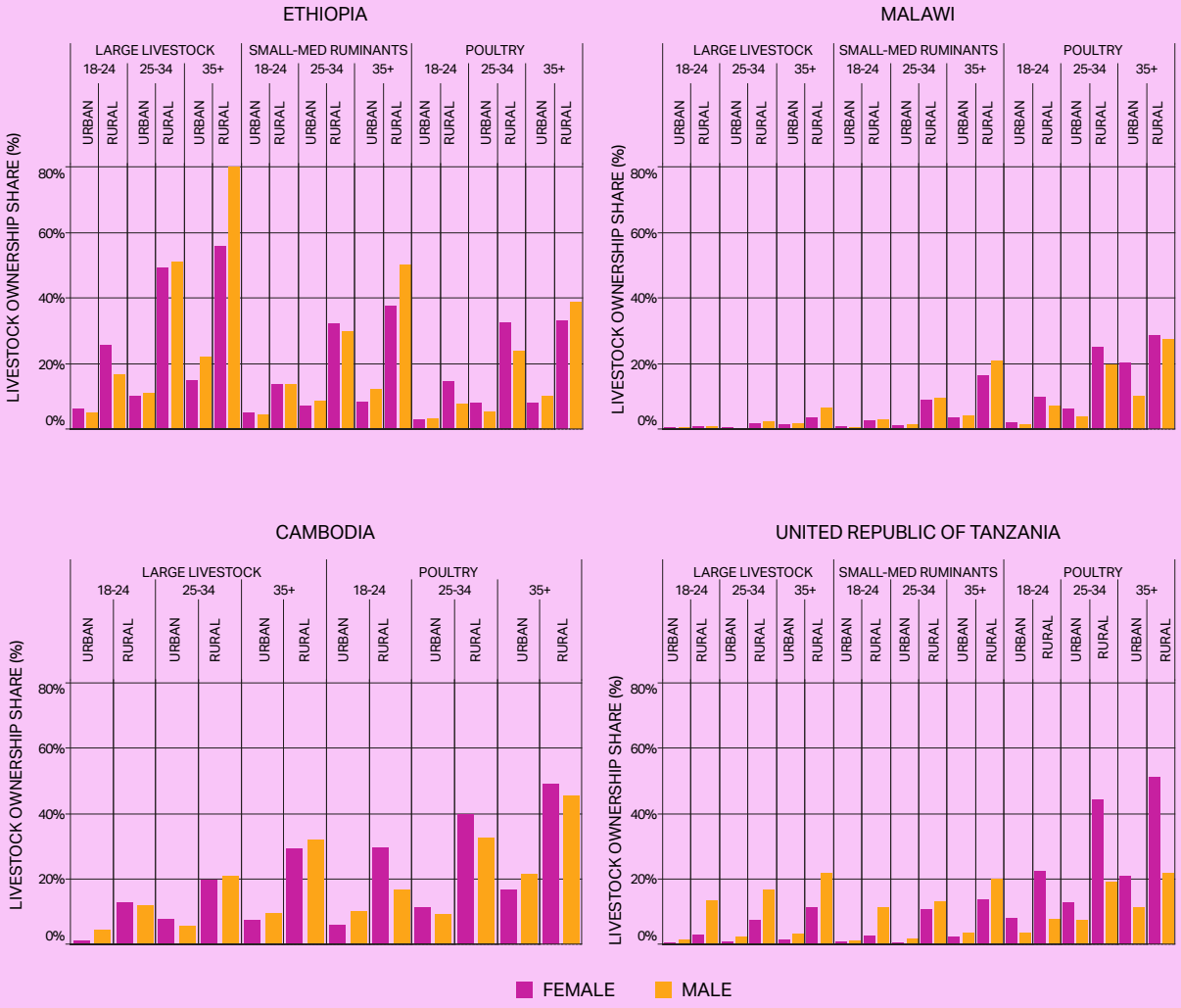
In both sub-Saharan Africa and Latin America, youth's access to technology such as mobile applications, as well as more advanced technologies like sonar and drones for those with greater economic means, could offset perceived risks related to climate change dissuading them from entering fisheries value chains.[126–128] In the Republic of Korea, specialized female fisherwomen/divers called *haenyeo* are aging, with most in their mid-60s or older, and are not being replaced by younger women due to the physical strain of the job, which is performed traditionally

> **"YOUNG WORKERS – ESPECIALLY WOMEN – DOMINATE EMPLOYMENT IN AQUACULTURE AND SMALL-SCALE FISHERIES.**

FIGURE 3.10

ACROSS ALL COUNTRIES, FEMALE YOUTH ARE CONSISTENTLY MORE LIKELY THAN MALE YOUTH TO OWN POULTRY, WHILE GENDER PATTERNS IN OWNERSHIP OF OTHER LIVESTOCK VARY

Incidence of livestock ownership among men and women of different age groups in Cambodia, Ethiopia, Malawi and the United Republic of Tanzania



Source: Author's own elaboration based on the LSMS+ surveys for Cambodia and Malawi and LSMS-ISA surveys for Malawi and the United Republic of Tanzania.

without the use of oxygen supplies. Economic issues also serve as a barrier to newcomers: younger women were dissuaded from joining *haenyeo* cooperatives where earnings are shared among a small group of existing fisherwomen.[129] Recently, however, a number of initiatives have been created to preserve the tradition and pass on the knowledge to younger generations through *haenyeo* associations, cooperatives and schools.[130] Young *haenyeo* are also using social media to boost their image and sell their produce.[131]

FINANCIAL CAPITAL

FINANCIAL INCLUSION FOR YOUTH

Youth (ages 15–24) are disproportionately unbanked, particularly in low- and middle-income countries. In sub-Saharan Africa, for example, nearly 40 percent of the unbanked population consists of young adults in this age group. Globally, in 2021, 66 percent of youth aged 15–24 owned a formal financial account, compared to 79 percent of individuals over 25 years.[132]

In rural areas, youth – particularly young women – are significantly less likely than their older counterparts to own a financial account (including both financial institutions and mobile money). This gap is most evident in protracted crisis and traditional agrifood systems, where financial services are often underdeveloped or inaccessible (Figure 3.11). The share of young women with a financial account is effectively zero in countries such as Afghanistan, South Sudan and Yemen, and does not exceed 40 percent in any of the countries with protracted crisis agrifood systems (Figure 3.11). Account ownership among rural young women is higher in countries in traditional and expanding agrifood systems, reaching over 50 percent in Georgia, Ghana, India, Kenya, Lesotho, Namibia and Uganda. Account ownership tends to increase as agrifood systems transition, but with significant heterogeneity among countries, and a higher share among young rural women in some cases.

A key structural barrier to youth financial inclusion is age-related legal restrictions. In many countries, young people under 18 are unable to open bank accounts or take out loans independently, limiting their ability to save, invest and participate in economic activities. To address this barrier, several countries are exploring regulatory reforms to expand youth financial access. In Uganda, the National Financial Inclusion Strategy (2017–2022) recommended lowering the minimum age to open a savings account to 15 years. The Central Bank of Jordan is considering similar reforms to allow youth as young as 15 to open accounts without a legal guardian's approval.[133]

In contexts where the formal financial infrastructure is either lacking or inaccessible, mobile money offers an efficient and affordable alternative for youth to access financial services. In sub-Saharan Africa, for example, 32 percent of young people had a mobile money account in 2021 (see Figure 3.12), followed by Latin America and Caribbean and Europe and Central Asia with 27 percent and 25 percent, respectively. Countries with traditional agrifood systems (e.g. Ghana and Kenya) tend to have higher rates of mobile money adoption among both youth and adults, reflecting the low accessibility of formal institutions.

Conversely, countries with protracted crisis agrifood systems tend to have lower overall adoption, indicating barriers such as weak or disrupted infrastructure, and economic instability. Expanding and diversifying agrifood systems show more mixed trends, with some countries exhibiting relatively balanced adoption rates across age

> "YOUTH ARE DISPROPORTIONATELY UNBANKED, PARTICULARLY IN LOW- AND MIDDLE-INCOME COUNTRIES.

FIGURE 3.11

A LARGE SHARE OF RURAL YOUTH DO NOT OWN A FINANCIAL ACCOUNT

Ownership of any financial account (financial institution and mobile money), by age group and gender

Note: The full dataset includes information from 139 countries, collected in 2021 and 2022; however, only 72 countries provide rural–urban disaggregation. The results here are restricted to those 72 countries.

Source: Author's own elaboration based on data accessed from the Global FINDEX Database 2021. www.worldbank.org/en/publication/globalfindex/Data

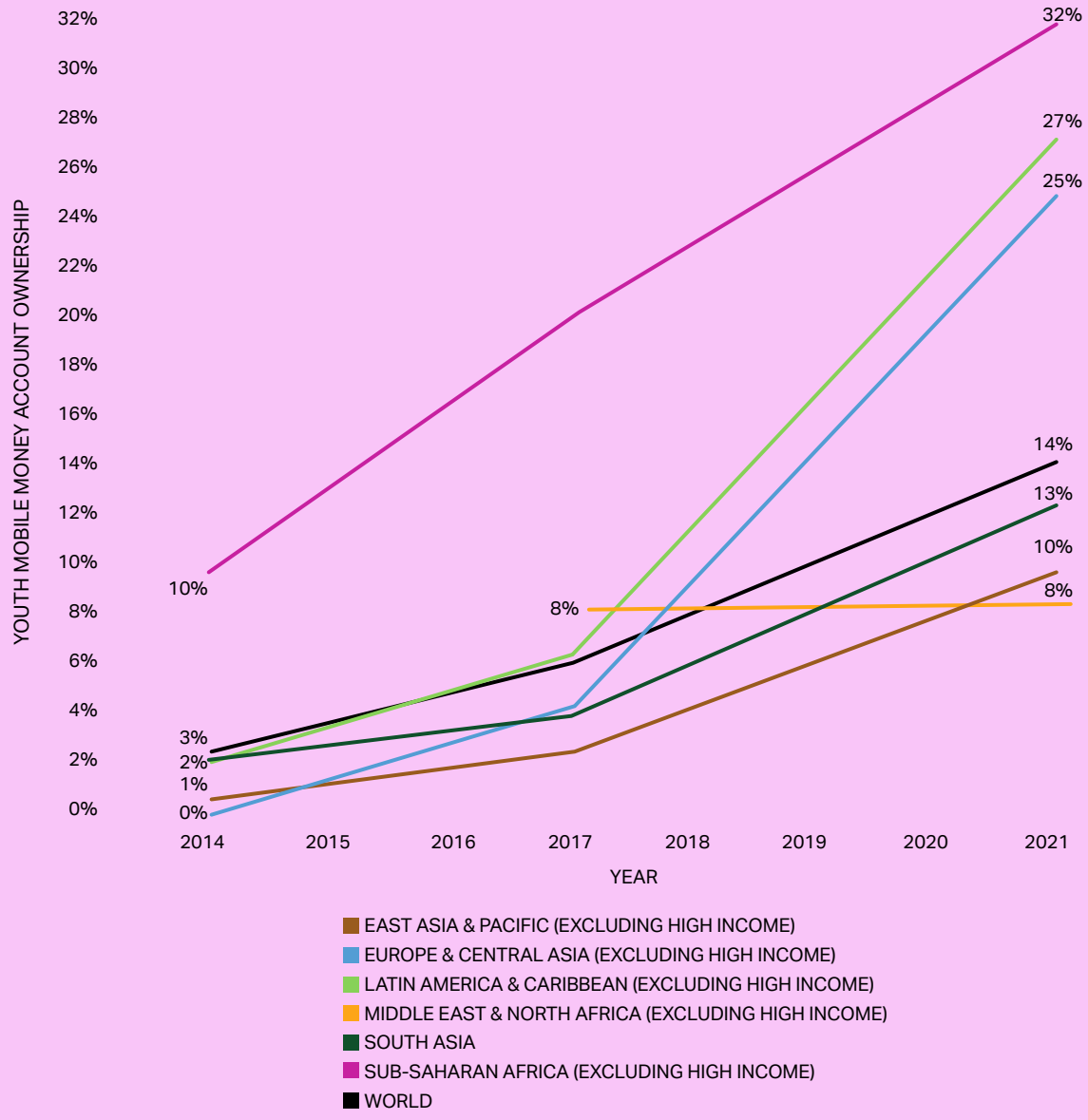
groups (Figure 3.13). Similarly, youth access to mobile money accounts has increased in all regions since 2014 (Figure 3.12).

Access to mobile phones and the internet are among the key factors driving the uptake of financial services among young people.[134] Research shows that gender gaps in youth financial inclusion can be attributed to varying levels of digital technology endowments. Youth with mobile phones are three times more likely to have financial accounts and three and a half times more likely to use them, with internet access doubling this likelihood.[135] However, gender and rural–urban disparities remain a significant challenge to youth financial inclusion. For example, Bangladesh faces a widening gender gap, affecting especially low-income women and those

FIGURE 3.12

YOUTH ACCESS TO MOBILE MONEY ACCOUNTS HAS INCREASED IN ALL REGIONS

Youth mobile money account ownership across regions, 2014–2021

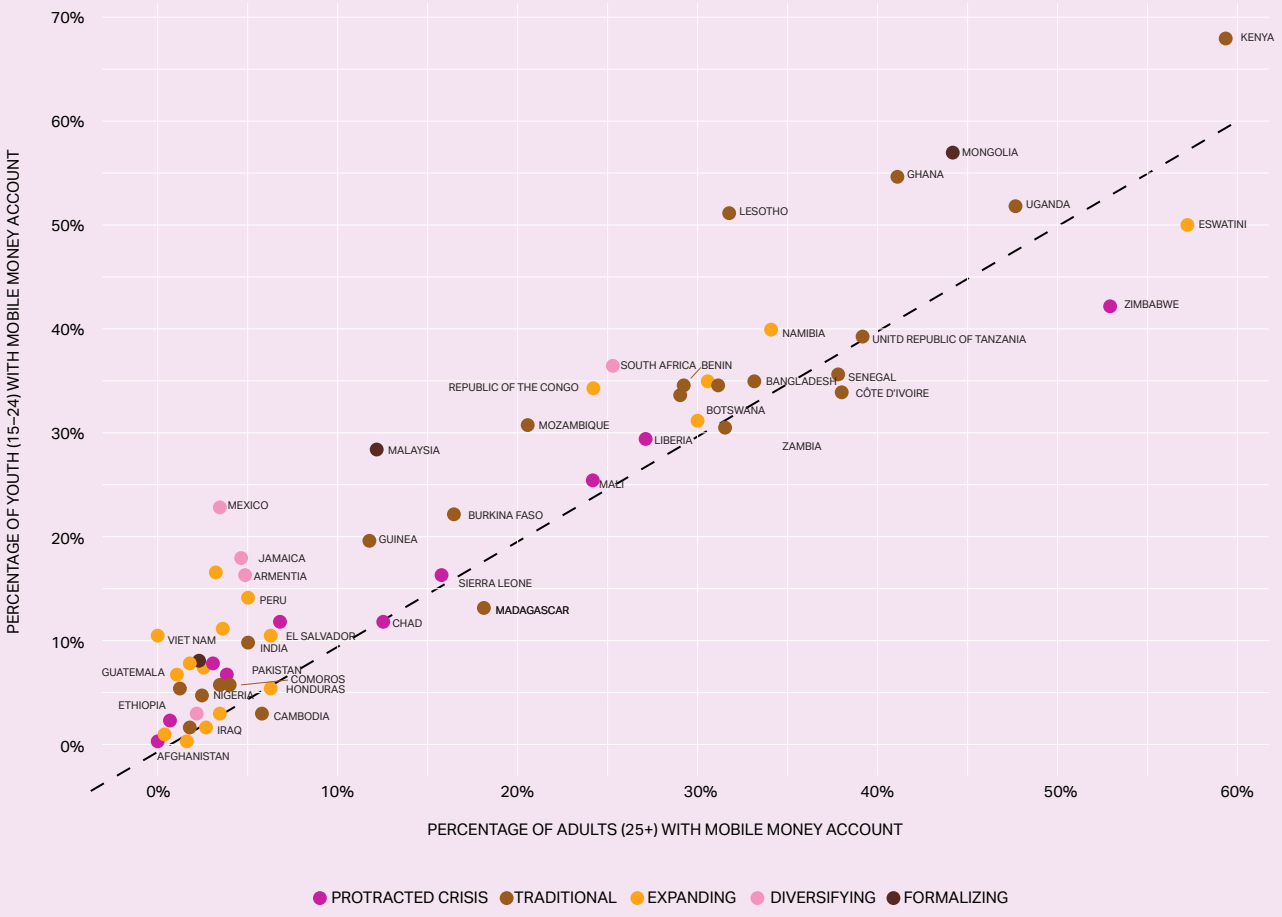


Source: Author's own elaboration based on the individual-level data from The Global FINDEX Database 2021. www.worldbank.org/en/publication/globalfindex/Data, accessed 12 September 2024.

residing in rural areas. Young women with lower access to digital connectivity at the outset of their financial inclusion journey are adversely affected, disadvantaging their lifelong financial inclusion.[134] A more in-depth overview of digital inclusion of young men and women is provided in the next section.

FIGURE 3.13

MOBILE MONEY ACCOUNTS ARE POPULAR AMONG BOTH YOUTH AND ADULTS IN MANY COUNTRIES IN TRADITIONAL AGRIFOOD SYSTEMS



Note: The sample includes information from 139 countries, with information collected in 2021 and 2022, but only 72 countries provide rural–urban disaggregation. The results here are restricted to those 72 countries.

Source: Author's own elaboration based on individual 2021 FINDEX data.

ACCESS TO MOBILE PHONES AND THE INTERNET ARE AMONG THE KEY FACTORS DRIVING THE UPTAKE OF FINANCIAL SERVICES AMONG YOUNG PEOPLE.

PHYSICAL CAPITAL

DIGITAL INCLUSION

Digital technologies are rapidly emerging as a means to achieve smarter, more efficient, sustainable and resilient agrifood systems.[137] In low- and middle-income countries (LMICs), the increasing penetration of ICTs has created new opportunities for young people, often previously underserved by face-to-face service providers,[138,139] to increase their access to information, training and marketing opportunities.[140–142] Furthermore, digitalization has helped reshape perceptions of agriculture, making the sector more appealing to younger generations.[143–145] While more data are available about youth access to digital technologies and ICTs than about many other assets, additional research is needed on the impact and determinants of digital technology adoption by youth in agrifood systems, taking into consideration age specificities as well as intersectional challenges linked to socioeconomic characteristics including gender, ethnicity and educational background.

Globally, youth are more digitally connected than older populations, with 81.2 percent of young people aged 15–24 using the internet, compared to 68.2 percent of adults aged 25–74 (Figure 3.14). In industrial agrifood systems, 98.2 percent of youth use the internet, whereas in traditional systems, only 33.9 percent have internet access. However, the share of youth in traditional systems using the internet is nearly 40 percent higher than their adult counterparts. This digital divide between youth and adults narrows as countries transition from traditional to industrial agrifood systems. Thus, while young people in LMICs are more likely than older generations to use digital technologies, poor infrastructure and affordability constraints continue to limit their ability to fully leverage these opportunities.[146] Few youth in LMICs have access to internet at home. In 2020, only 5 percent of rural youth and 13 percent of urban youth in low-income countries had internet access at home, compared to approximately 90 percent of youth in high-income countries.[147]

While reducing the coverage gap in broadband connectivity and increasing the affordability of internet data remain an issue in rural and remote areas,[148,149] internet access is only one of a set of barriers to rural youth's digital inclusion. Socioeconomic, behavioural and cognitive challenges lead to unequal access to digital devices, unaffordable services, limited digital skills, lack of awareness and usability of digital services, and safety and security concerns.[150,151] As a heterogenous group with varying levels of education, skills and household wealth,[68] rural youth experience these barriers in different ways. For example, adolescent girls and young women are particularly limited in their ability to participate in the digital world, due to restrictive social norms and deep-rooted structural inequalities, such as lower education and income. For every 100 male youth aged 15–24 who have digital skills, only 65 female youth do.[152] Moreover, evidence from LMICs reveals that girls gain access to digital technology at an older age and are more supervised or restricted from using computers or mobiles than boys.[153] Another commonly reported

> **"IN 2020, ONLY 5 PERCENT OF RURAL YOUTH AND 13 PERCENT OF URBAN YOUTH IN LOW-INCOME COUNTRIES HAD INTERNET ACCESS AT HOME.**

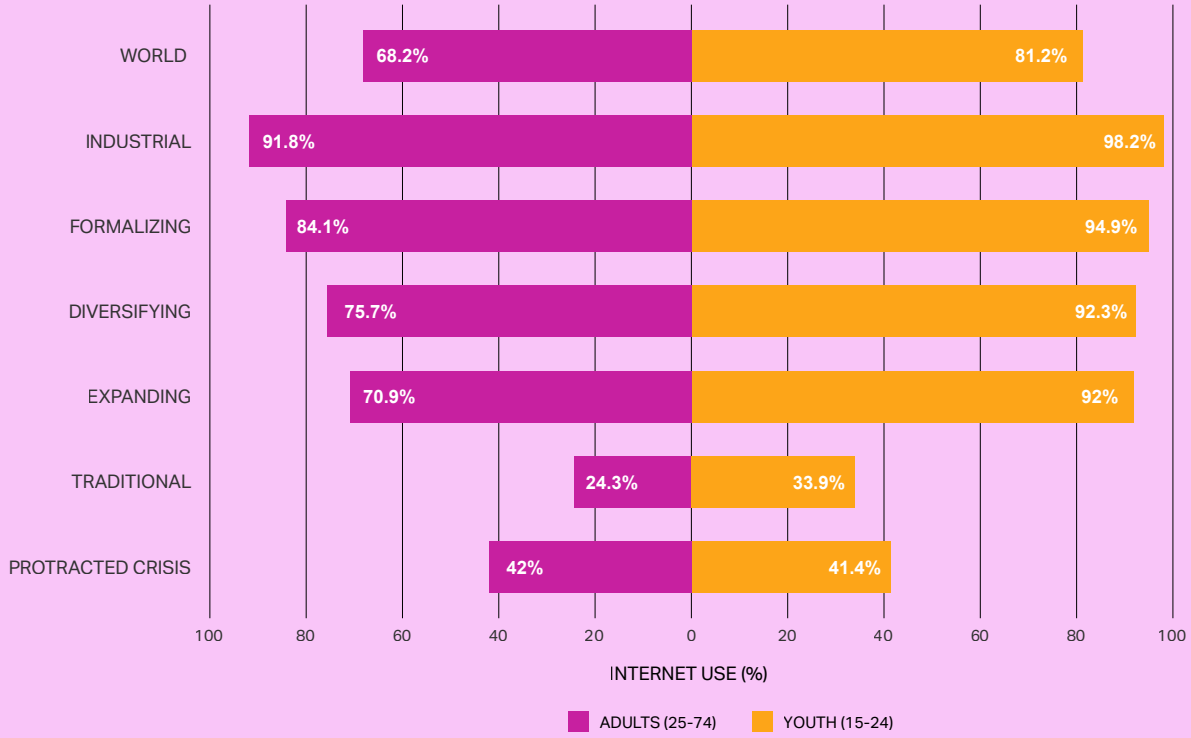
"after-access" barrier is the lack of youth-friendly digital services or content available in local languages for those youth who are not conversant in English or other widely used languages.

Despite these constraints, youth are typically more tech-savvy than adults and are uniquely positioned to leverage digital technologies to increase the productivity, profitability, sustainability and resilience of farms and agribusinesses.[50, 154] Digital technologies not only facilitate access to information, they are also revolutionizing agricultural practices allowing young farmers and agripreneurs to engage in contract farming, direct marketing, logistics coordination, networking and access to funding opportunities.[155] Technological innovation helps to attract young people who would ordinarily not be interested in farming, including well-educated urban youth.[156,157]

FIGURE 3.14

FIGURE 3.14 YOUTH ARE MORE LIKELY TO USE THE INTERNET THAN ADULTS, EXCEPT IN PROTRACTED CRISIS AGRIFOOD SYSTEMS

Youth internet use vs adult population, by agrifood system typology



Note: The estimates are weighted means, with weights adjusted for the population size of each country. The dataset includes the proportion of individuals who used the internet from any location in the last three months, covering internet usage statistics for individuals aged 15–74 across 107 countries.

Source: Author's own elaboration based on data from the ITU (International Telecommunication Union) DataHub (https://datahub.itu.int/data/?e=ITA&c=701&i=11624&d=Age&g=9224), accessed 5 March 2025.

> **FOR EVERY 100 MALE YOUTH AGED 15–24 WHO HAVE DIGITAL SKILLS, ONLY 65 FEMALE YOUTH DO.**

Youth in agriculture are utilizing digital agricultural solutions. Out of a sample of 30 000 youth engaged in agriculture across 11 African countries, 23 percent were found to be engaging with at least one form of digital agricultural technology (an app, SMS, website or software). According to respondents, ease of use, range of information provided and affordability are three critical success factors of digital solutions.[158]

Social media platforms, in particular, are creating new roles within agricultural value chains, such as agribusiness mentors, agricultural influencers and "proxy farmers".[159] These platforms are also being used for crowdfunding initiatives, enabling young agripreneurs to secure capital independently of traditional financial institutions.[159] Beyond social interactions, internet and social media platforms are increasingly being used for practical purposes such as learning, job hunting, and accessing and sharing technical or market information, as well as buying and selling goods and services online.[160,161] Digital advisory services, marketplaces, fintech, farm management and supply chain traceability apps are also expanding opportunities for youth engagement.[145] These innovations can drive entrepreneurship and create employment opportunities for rural youth, enabling them to diversify their livelihoods both within and beyond the rural farm economy.[159]

Mobile phone devices serve as the primary gateway for accessing the internet and digital services in LMICs,[148] a trend that includes young people. In DHS data for a set of 26 countries, ownership of a mobile phone is on average lower among youth than among older cohorts, and lower still among rural youth, especially girls, than among urban youth (Figure 3.15), although there is a great deal of heterogeneity among countries. On average in the 26 countries, 48 percent of rural female youth and 58 percent of rural male youth own a mobile phone compared with 76 percent of girls and 80 percent of boys in urban areas. Mobile phone ownership is markedly higher among youth in the Asian and European countries in the sample, and lower in most sampled sub-Saharan African countries.

MECHANIZATION AND INPUTS

Agricultural mechanization and improved technology have important implications for young people's livelihoods, their relations with older generations and their engagement in agrifood systems. Mechanization scales up agricultural production and enhances the productivity and marketable surplus of small farmers, pastoralists and fisherfolk.[162] Mechanization also can help aging farmers continue farming, particularly by enabling a shift to more easily mechanized crops in labour-scarce contexts.[70] Labour-saving technologies make farming less reliant on family labour, altering traditional gender and generational roles in agricultural households. At the same time, advanced agrifood systems technology may be easier for young people to handle, if they have higher levels of education. This, in turn, could increase their decision-making power on the family farm or off-farm business.

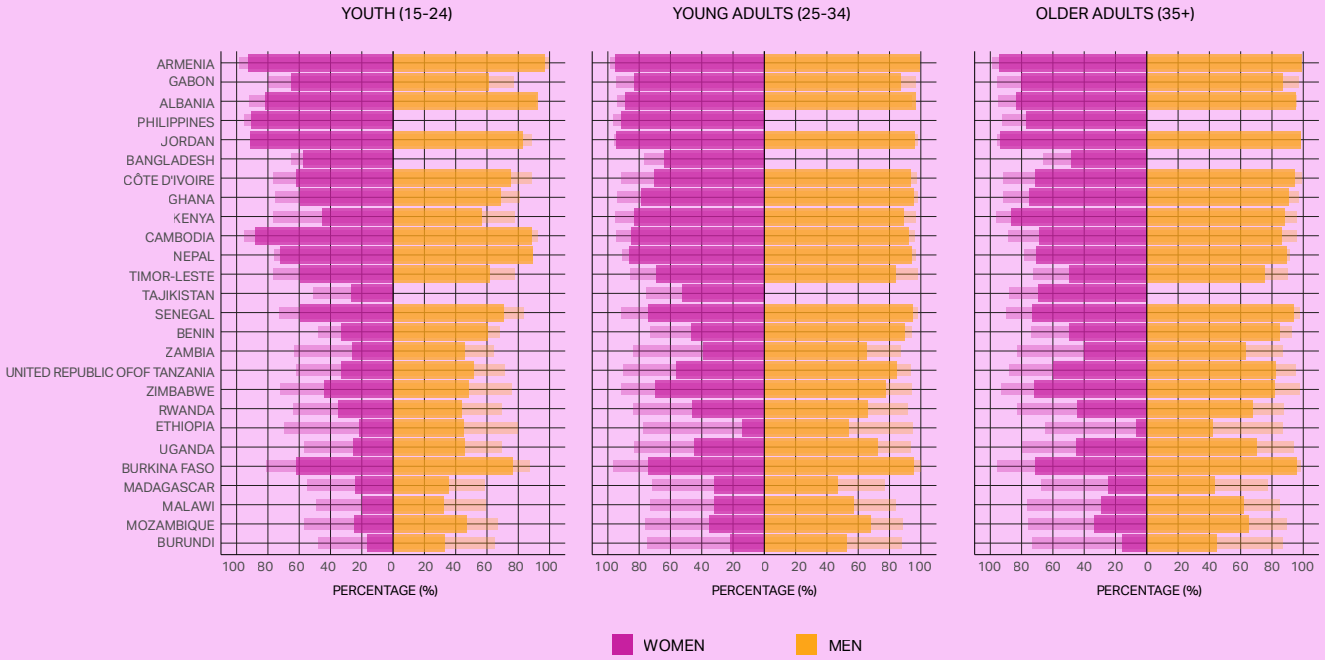
Small-scale mechanization offers numerous benefits for young rural farmers, enhancing efficiency and productivity. In Zambia, for example, the use of handheld tractors for land preparation and furrow making has proven to be less costly and more labour-efficient, increasing both crop yield and profits for young entrepreneurs.[163] In Kenya, rural youth have adapted land augers for creating water-harvesting features, significantly reducing labour requirements and supporting climate-smart agriculture. Moreover, some young farmers have developed expertise in drone operations for small-scale aerial spraying of crops and the installation of pond aerators to improve water quality and fish health, demonstrating their capacity to engage with advanced technologies.[163]

While mechanization may increase the demand for higher-skilled jobs and allow farmers to shift focus to land management activities more appealing to youth,[164] in labour-abundant areas mechanization may displace workers, particularly in routine tasks

FIGURE 3.15

RURAL YOUTH ARE SIGNIFICANTLY LESS LIKELY TO OWN A MOBILE PHONE THAN URBAN YOUTH

Mobile phone ownership by age group, sex and location



Note: Pink and yellow bars represent the incidence of mobile phone ownership among men and women, respectively, across three age groups – Youth (15–24), Young adults (25–34) and Adults (35–49) – in rural and urban areas. Solid-coloured bars show mobile phone ownership among rural populations, while semi-transparent overlays indicate mobile phone ownership among urban populations. The male individual module was not implemented in Bangladesh, the Philippines and Tajikistan. Countries are arranged by GDP per capita (PPP), ranked from lowest (bottom) to highest (top).

Source: Author's own elaborationbased on data accessed from the Global FINDEX Database 2021.

> **YOUNG FARMERS ASPIRE TO ENGAGE IN MODERN AGRICULTURE THAT RELIES ON IMPROVED TECHNOLOGY.**

such as planting and harvesting, disproportionately impacting lower-skilled groups like young people and women.[165] Complementary interventions such as skills development and social protection can help mitigate the negative impacts on youth employment.

Young farmers aspire to engage in modern agriculture that relies on improved technology.[44] For example, younger apple farmers in China (aged 35 and under) showed the highest willingness to pay for precision pesticide technology services and equipment, indicating a strong interest among younger farmers in being early adopters of innovative agricultural technologies that enhance productivity and efficiency.[166] *The 2022 State*

of Food and Agriculture report presents case studies from the Republic of Korea (ioCrops) and the United States of America (Atarraya and Cattler) that highlight youth's openness to innovation and underscore their critical role in shaping the future of agriculture.[165] Other studies indicate that young farmers are more likely to adopt improved crop varieties, as seen in the United Republic of Tanzania.[167]

Despite their innovative potential, rural youth face significant challenges in accessing modern farming tools and irrigation technologies. Limited financial resources often hinder their ability to invest in mechanization. Furthermore, and as mentioned above, land access remains a critical barrier, particularly for irrigation systems, where secure land tenure is essential.[1]

Access to agricultural inputs such as quality seeds, fertilizers and pesticides can also represent a challenge for young people in LMICs. Data from FAO's RuLIS database suggest that adult-headed households, as compared to youth-headed households, exhibit greater uptake of and access to improved seeds (8 out of 10 countries), fertilizers (10 out of 14 countries) and chemicals (12 out of 18 countries) (Figure 3.16). This outcome is linked to other constraints including insufficient financial resources, low access to credit and inadequate access to extension services. Moreover, programme design can also constitute a barrier for youth. A multi-year study in Malawi of the Farm Input Subsidy Programme found that the targeting criteria, which focused on households led by married or widowed individuals, limited the access of unmarried youth to the programme's full benefits. Those that did benefit relied on social connections to participate.[84,168]

TRANSPORTATION, IMPROVED INFRASTRUCTURE AND PAVED ROADS

Transport availability and affordability shape youth employment opportunities on and off farm in agrifood systems. Youth often face significant barriers to mobility. Access to transportation infrastructure in rural areas is particularly constrained, with most smallholder farmers facing limited connections to external markets (see also Chapter 2).[169] In addition, high transportation costs relative to household income, coupled with poorly integrated transport networks, pose significant affordability challenges. These factors limit how often young individuals can use available transport options.[170]

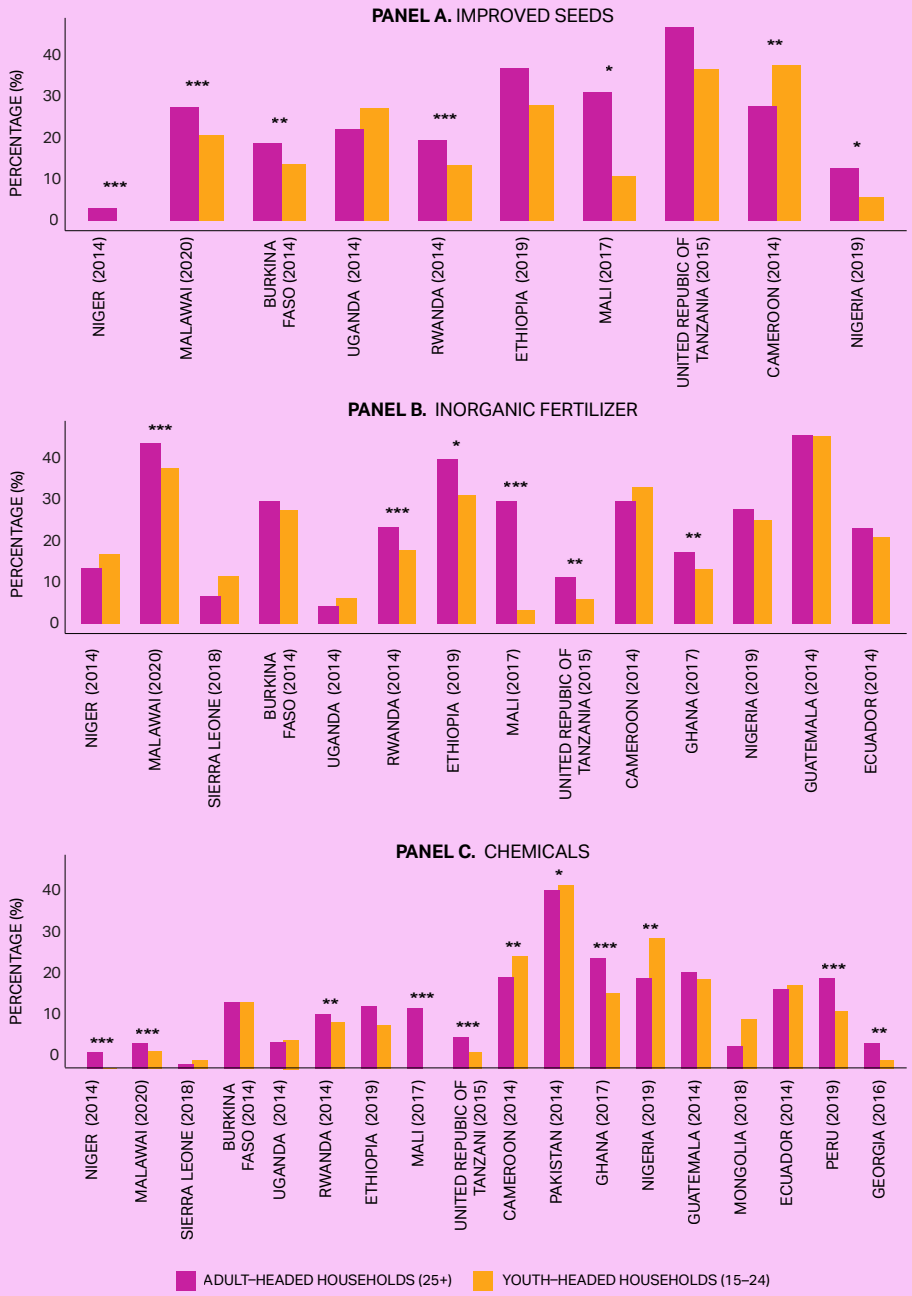
For young people in peri-urban and rural areas, access to transport is often a key determinant in securing non-agricultural jobs, which are often seen as a pathway to gaining improved incomes.[171] In Western Kenya, rural youth often resort to "tarmacking", walking long distances on potholed roads to urban centres in search of work, only to return home empty-handed. Limited mobility disproportionately affects young women, often confining them to home-based entrepreneurial activities.[172] Research demonstrates that inadequate rural transport systems in countries like Nigeria hinder the growth aspirations of female entrepreneurs in agrifood systems and compound existing gender barriers.[173] Similarly, a safety audit of rural public spaces conducted in Gujarat, India, shows that inadequate infrastructure, including the poor conditions of road and lack of safe modes of transportation, affects young women and girls by limiting their options for safe commutes and access to higher education, which is not available in many rural villages.[174]

More broadly, restricted mobility – exacerbated by household labour demands – negatively affects young people's attitudes towards agriculture and rural life, often prompting migration to urban areas in search of better opportunities.[175] In contexts where rural transport systems remain underdeveloped, these constraints reinforce existing inequalities and limit the economic aspirations of rural youth.

FIGURE 3.16

YOUTH-HEADED HOUSEHOLDS ARE DISADVANTAGED IN ACCESS TO IMPROVED SEEDS AND FERTILIZER

Share of households (%) using improved seeds, fertilizers and chemicals, by household head age



Note: Countries ordered by increasing level of per capita GDP. Farming households only. Significance levels:*** p<0.01, **p <0.05, * p<0.10.

Source: Author's own elaboration based on data from FAO. 2024. RuLIS – Rural Livelihoods Information System. In: FAO. Rome. [Cited 5 December 2024]. www.fao.org/in-action/rural-livelihoods-dataset-rulis/en

©FAO/MARIO ARAUJO IN CASERÍO LA PEÑA IN EASTERN EL SALVADOR, 22-YEAR-OLD COMMUNITY PROMOTER NUBIA FUENTES LEADS AN FAO-IMPLEMENTED, GREEN CLIMATE FUND-FINANCED PROJECT FOR SUSTAINABLE SOIL MANAGEMENT.

SPOTLIGHT 3.1 AGRI-DIGITAL FINANCIAL SERVICES FOR YOUNG FARMERS AND AGRIPRENEURS

Digital financial services (DFS) present a major opportunity for young farmers and agripreneurs, yet adoption remains limited. Only 5 percent of young people globally borrow money to start, operate or expand a farm or business, while 13 percent save for such purposes, with most relying on informal financial mechanisms.[i, ii] In Bangladesh, for example, although 30 percent of micro-entrepreneurs have a mobile wallet, they primarily use it for personal transactions rather than business purposes.[iii]

The CGAP National Surveys of Smallholder Households highlight significant disparities in mobile phone ownership and mobile money account usage among youth (ages 15–30) across different countries. While mobile phone ownership is relatively high across all surveyed nations, the adoption of mobile money services remains inconsistent and, in some cases, extremely low.[iv]

According to Global Findex 2021, cash remains the dominant method for making or receiving payments for agricultural products.[v] In Kenya, over 80 percent of farmers use mobile money but only 15 percent rely on it for agricultural transactions. Usage varies by marketing channel – only 8 percent of farmers selling directly to customers use mobile money compared to around 20 percent of those selling produce to local traders, companies or cooperatives.

Smallholders have diverse financial needs – some require short-term financing for high-quality inputs, while others need long-term financing for assets and modern equipment such as machinery and drip irrigation systems. The largest financing gap concerns the latter group. In sub-Saharan Africa, 99 percent of smallholder long-term agri-financing needs remain unmet compared to 73 percent of short-term needs. This gap persists partly due to limited availability of agriculture-specific digital savings products, most of which focus on short-term input requirements.[vi]

Meanwhile, research suggests that young individuals in smallholder households have a high savings capacity, with some saving two to five times more than adults, revealing untapped potential for service providers to address the needs of this segment.[iv, viii]

According to the GSMA, digital insurance products account for 39 percent of all agri-DFS in LMICs.[vi] However, adoption remains low, with less than 20 percent of smallholder farmers worldwide having agricultural insurance coverage. Low uptake is driven by several factors, including lack of awareness among smallholders, high premium costs and a general lack of trust in financial institutions.[viii] From providers' perspective, insurance for farmers is challenging to design and offers low profitability due to high customer acquisition and service delivery costs, and the low value of premiums.[ix]

Digital financial services are altering how young farmers and agripreneurs manage payments, credit, savings and insurance. Integration of advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT) and big data analytics has led to the development of innovative financial products such as credit-scoring algorithms, crowdfunding platforms and digital agri-wallets. According to the GSMA, agricultural DFS accounts for 25 percent of digital agriculture services in LMICs, with sub-Saharan Africa leading with 111 out of 150 agri-DFS initiatives. The agri-DFS landscape varies largely by region: mobile money platforms dominate in

sub-Saharan Africa, fintechs play a larger role in South and Southeast Asia, while in Latin America and the Caribbean, traditional FSPs like banks and microfinance institutions (MFIs) lead smallholder financing.[vi]

INNOVATIVE FINTECH AND AGRI-DFS SOLUTIONS FOR YOUTH

Tailored financial products: ThriveAgic is a youth-led and youth-focused agri-tech company in Nigeria, with a broad range of initiatives, including financial inclusion, skills development and improved market access for smallholder farmers. Its financial services include loans backed by digital collateral and weather-indexed crop insurance. ThriveAgic's financing model aligns with farmers' cash flow cycle, starting before sowing. After harvest, farmers sell their crops to ThriveAgic at pre-agreed prices to repay loans. With flexible payment schedules and extended, ThriveAgic has achieved high adoption rates.[x,xi] To date, ThriveAgic has impacted over 800 000 smallholder farmers – 50 percent of whom are youth [xii] – and has disbursed over USD 150 million in financing.[xiii]

Multi-Service Digital Agriculture Platform: Over the last decade, the rise of digital agriculture platforms – facilitating market access through digital procurement and e-commerce solutions – has generated financial footprints for smallholders through transactional data and farm bookkeeping. This rich client data has made it easier for Financial Service Providers (FSPs) to profile farmers, access their creditworthiness and extend tailored financial services.[vi] These digital agricultural platforms serve as key intermediaries between FSPs and young rural clients, enabling service delivery through digital channels. FSPs benefit from cost and time efficiencies on a range of operational processes, such as client registration, due diligence, loan appraisal and disbursements. In turn, rural youth, can gain access to a broader range of flexible, affordable, and customized financial products and services better suited to their needs.[xiv]

MNOs offering innovative agri-DFS solutions

Mobile Network Operators (MNOs) are key players in the digital agriculture space, targeting the rural sector with a suite of services and products such as mobile IoT for smart farming and mobile-based agro-advisory services, in addition to mobile money. MNOs also foster an enabling environment for agritech companies by offering valuable opportunities to scale services via mobile money API integration and strategic partnerships. This allows agritechs to leverage MNO assets, such as broad user bases, distribution networks, trusted brand reputation, local market insights, stakeholder connections, and valuable customer and transaction data.[vi]

Safaricom, Kenya's largest MNO, exemplifies this role. It launched M-Pesa in 2007, revolutionizing mobile money services, followed by DigiFarm in 2017, an integrated mobile platform that provides end-to-end, farm-to-market services to smallholders. The platform leverages digital sales records to support its credit-scoring algorithm and facilitate credit access. To date, it has disbursed KSh 940 million in loans to over 1.6z million registered farmers.[xv] Youth engage with DigiFarm either as farmers or in roles that support its services.[xvi]

DFS providers creating opportunities for youth in non-farm livelihoods: Digital Financial Service providers targeting low-income rural farmers often offer offline options to ensure last-mile financial inclusion. Many FSPs and digital agriculture platforms engage youth from local communities as rural agents to conduct field visits, collect data and support remote farmers – particularly those with limited access to internet, digital technologies or low digital literacy. This creates employment opportunities for tech-savvy youth within the agrifood system through non-farm livelihoods. DigiFarm employs a network of 1 500 ground-level agents called DigiFarm Village Advisors (DVAs) to assist clients in registering on the platform and using its services.[xvii] Mobile Money platforms like M-Pesa also engage youth to run local agent retail outlets and facilitate mobile money transactions. Another agritech, Hello Tractor, a tractor-sharing service, also engages and trains youth as booking agents in rural communities who aggregate demand from farmers, capture relevant farm and farmer data, and make payments on the platform.[vi]

DISCUSSION

The rise of agri-DFS is transforming access to finance for young farmers and agripreneurs, helping to address critical barriers. While gaps remain in tailored and targeted product offerings, innovative fintechs, digital agriculture platforms, and MNOs are creating new pathways for financial inclusion in rural areas. Additionally, DFS is generating new employment opportunities for rural youth, allowing them to engage as service providers,

agents and digital entrepreneurs within the agrifood system.

However, sustainability of youth-led agri-fintechs remains a key challenge. Although numerous startups have emerged with innovative business models and tailored financial products, some met their ill-fate due to unsustainable business strategies, financial mismanagement, or funding halts.[xviii] Additionally, adequate customer protection measures must be in place, including clear and enforceable rules for DFS providers and the establishment of a public supervisory body to address financial cybercrimes.[xiii] To fully unlock the potential of agri-DFS for youth, concerted efforts by all stakeholders is needed, where FSPs, policymakers, and development organizations collaborate to design and scale inclusive financial products. With continued investment in digital innovation, capacity-building, and enabling policy environments, DFS can drive a more inclusive and dynamic agricultural economy – one where young farmers and agripreneurs can thrive as key actors in the digital transformation of agrifood systems.[xix]

Notes: Refer to the **Notes section** for full citations.

©FAO/STUART TIBAWESWA AS PART OF THE FAO–CHINA–UGANDA SSC PROJECT TO INTRODUCE HIGH-YIELD, DROUGHT- AND DISEASE-RESISTANT FOXTAIL MILLET (SETARIA ITALICA), A YOUTH FARMER WINNOWS AND CLEANS THE GOLDEN-REDDISH GRAIN—WHICH MATURES IN JUST 85 DAYS AND IS RICH IN PROTEIN AND VITAMIN B_{12}

SPOTLIGHT 3.2 YOUTH WITH DISABILITIES

According to Article 1 of the United Nations *Convention on the Rights of Persons with Disabilities (CRPD)*, persons with disabilities are individuals "who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others".[i] While the CRDP establishes a legal framework for promoting and protecting the rights of persons with disabilities, Ebuenyi *et al*., highlighted significant discrepancies between the principles of the CRPD and the provisions of domestic laws as well as monitoring and reporting.[ii]

Globally, there are between 180 million and 220 million youth with disabilities, nearly 80 percent of which live in developing countries.[iii] Youth with disabilities tend to be overrepresented among the poorest and most marginalized young people, with disability and poverty reinforcing each other across all types of impairments/disability. Disabled women tend to face higher rates of violence, including sexual violence,[iv, v] and their specific condition is overlooked in the large majority of national legal frameworks.[vi]

©FAO/LUIS TATO
IN ULAFU VILLAGE, SIAYA COUNTY, KENYA, YOUNG AGRIPRENEUR STEVE OMONDI, WHO SUFFERS FROM A HEARING IMPAIRMENT, CARRIES MAIZE TO FEED HIS CHICKENS, REFLECTING HOW YOUTH ARE TURNING TO POULTRY FARMING TO BUILD SUSTAINABLE LIVELIHOODS.

Research suggests that having a disability is also associated with a higher probability of food insecurity.[vii] According to a survey targeting college students,[viii] 35.9 percent of respondents with disabilities reported food insecurity as opposed to 16 percent of those without a disability. Food insecurity among persons with disabilities is likely exacerbated by discrimination and stigma towards them. Public health systems and research outcomes have often referred to disability as something to "prevent, cure, or treat", thereby contributing to shaping and consolidating views around persons with disabilities as "not valuable contributors to society". [ix]

Young persons with disabilities face specific barriers to accessing health care, education and employment opportunities, and may be limited in their social participation.[x, xi] School attendance represents a huge challenge for children and young persons with disabilities, particularly for those living in developing countries: 98 percent do not attend school, and those who do have lower educational attainment compared to their peers without disabilities,[xii, xiii] de-facto hampering their school-to-work transition. This is in part due to the limited accessibility of both schools and transport, as well as poverty and stigma, among other reasons. Compounding this lack of access, persons with disabilities who attend school are also less likely to complete their education at all levels than persons without disabilities.

Some countries and territories have incorporated concerns related to learners with disabilities into their policies and legal frameworks; others such as Cuba and Palestine have implemented successful measures to close the education gap to the point that there are no longer recorded cases of children or young persons with disabilities who have never attended school. However, the global COVID-19 pandemic severely hampered progress in making national education systems inclusive with 17 percent of persons with disabilities attending education dropping out during the pandemic.[vi]

Youth with disabilities account for a large majority of young people who are neither in employment, education or training (NEET). Nearly half are likely to be NEET compared to 25 percent of youth without disabilities. The gap is largest in Eastern and Southeastern Asia (41 percentage points), Europe and Northern America (33 percentage points) and Northern Africa and Western Asia (31 percentage points). Policy recommendations related to the employment of young people and others with disabilities are similar to some of those reported in Chapter 7 of this report. Namely, specific national policies and employment schemes need to promote the inclusion of persons with disabilities in the economy, youth with disabilities can benefit from access to digital innovation and technology as well as green jobs, and the formalization of jobs can support decent employment for persons with disabilities (see also Chapter 4).[vi]

Regarding technology, according to the CRPD, information and communication technologies (ICTs) play a critical role in enhancing education and reducing isolation for young persons with disabilities, while empowering them and ensuring that "they fully enjoy human rights and fundamental freedoms".

Additionally, physical accessibility remains a critical barrier preventing persons with disabilities from participating in institutions and social life, beyond schools, in both rural and urban settings.[xiv] As discussed in Chapter 3, social capital for youth is critical to support their access to assets and resources needed for agrifood systems. Therefore, ensuring that youth with disabilities are included in organizations and groups fosters their integration into societies and economies.[xv]

Ensuring the inclusion of young people with disabilities is not only a human right; it is a prerequisite in countries around the globe for the realization of sustainable economic growth and inclusive agrifood systems.

Notes: Refer to the **Notes section** for full citations.

ENGAGEMENT MOVES FOOD FORWARD

©UNEP/TAUFANY ERIZ
IN CIWIDEY, INDONESIA, A YOUNG FARMER PLANTS A TREE.

04 YOUTH ENGAGEMENT AND QUALITY OF WORK IN AGRIFOOD SYSTEMS

© FAO/HEBA KHAMIS
IN BANGAR EL SOKOR, EGYPT, YOUNG WORKERS ARE ARRANGING THE TOMATOES TO DRY IN THE SUN.

KEY MESSAGES

- Agrifood systems are a key source of livelihoods for youth, especially in less formalized agrifood systems.
- Globally, 44 percent of working youth and 38 percent of working adults were employed in agrifood systems in 2021.
- The share of working youth in agrifood systems employment declines as agrifood systems transition, ranging from 82 percent in protracted crisis to 23 percent in industrial agrifood systems.
- Since 2005, the global shares of working youth and adults have decreased by about 10 percentage points, driven mainly by decreases in agricultural employment. Across agrifood systems, employed youth and adults exit agriculture at a similar pace.
- Agrifood systems are key entry points to the labour market for younger youth aged 15–19. As agrifood systems transition, the entry point for younger youth shifts from agriculture to off-farm agrifood system employment, with this sector becoming increasingly more important for young women compared to young men.
- Youth, and especially younger youth, are less likely to have more than one economic activity outside agrifood systems. As they grow older, youth diversify and eventually exit agrifood systems employment.
- Intergenerational economic mobility outside of agriculture is more likely, particularly for young men, in contexts of higher agricultural labour productivity growth.
- Youth, and especially young women, engage in more precarious work in agrifood systems. Though declining with agrifood systems transition, a consistently greater share of young women are in vulnerable employment, particularly as contributing family workers, compared to their male counterparts.
- Young women are less likely to work full time, and across most agrifood systems young women are more likely than young men to remain outside the labour force and not in school.
- Young women allocate almost three times more time than young men to unpaid and domestic work.

INTRODUCTION

Youth represent an important share of the workforce in agrifood systems. In countries at earlier stages of transition, agrifood systems, and particularly agriculture, represent the largest shares of employment,[1–4] with children and youth accounting for a significant share of the working population. Agrifood systems can also play a central role in youth job creation,[5, 6] though the provision of decent employment remains a challenge.[7, 8] As agrifood systems transition, and countries structurally transform, agrifood systems employment represents a decreasing share of total employment, and children and youth account for a smaller share of the working population (see Figure 2.5). The challenge increasingly becomes one of addressing labour shortages and generational renewal in agriculture,[9–11] which undermines future agrifood systems stability and rural revitalization[12,13] (see Spotlight 1.1).

Understanding the patterns of youth employment in agrifood systems, both in agriculture and off-farm, is critical to informing policies aimed at supporting productive and positive engagement of youth in the sector. This chapter sheds light on patterns of on- and off-farm agrifood systems employment (see Box 4.1 for a definition of employment) across agrifood systems over time and by age and gender cohorts. It looks not only at employment in terms of participation, but also in terms of time allocation, individual-level diversification and intergenerational mobility. It also discusses the quality of the jobs young men and women hold in agrifood systems, with specific attention to gender disparities. Finally, the chapter documents how the unpaid care and work burden on women undermines young women's employment in agrifood systems.

© FAO/JUDITH MULINGE
IN TURKANA COUNTY, KENYA, ONESMUS ELAR DRIES GROUNDNUTS AT THE COMMUNITY STORE COMPOUND.

BOX 4.1 YOUTH EMPLOYMENT AND WORK IN AGRIFOOD SYSTEMS: METHODOLOGICAL CONSIDERATIONS AND DATA

Official employment statistics define employment in terms of an employed individual's main job in the last seven days, including only activities performed for pay or profit as per the distinction between work and employment adopted at the Nineteenth International Conference of Labour Statisticians (ICLS).[i] Yet, this definition does not adequately capture multiple forms of work and engagement in agrifood systems. A large share of individuals and households working in agrifood systems may be engaged in different activities producing goods mainly for their own consumption, activity which may be considered as work but not employment.[ii, iii] Individuals may also engage in multiple jobs and simultaneously work in agriculture or off-farm segments of agrifood systems activities.[ii]

These measurement considerations are critical when determining the importance of agrifood systems for youth in low- and middle-income countries. When they engage in additional jobs, a large share of youth is either involved in subsistence farming or in agrifood systems.[iv] To adequately capture the role played by youth in agrifood systems, as well as the importance of agrifood systems in youth's livelihoods, this chapter considers both work and employment, to account for the various forms of work and engagement in agrifood systems.

Agrifood systems are defined following a specific categorization of industry codes (ISIC), distinguishing between agriculture, food processing and services, and manufacture of non-food agricultural products.[ii] A detailed definition and categorization of ISIC codes can be found in **Table A2.1** of Appendix 2. Some analyses also differentiate between different types of agrifood systems, following recent typologies[v,vi] (see **Box 1.1**).

This chapter also uses multiple sources of data. First, the chapter uses age-disaggregated global data on the share and number of youth and adults in agriculture and off-farm agrifood systems. The modelling approach draws on that of Davis *et al.*[ii] and employs unpublished ILO estimates based on ILO modelled estimates (November 2023)[vii] on the share of youth among all agricultural workers. More details on the model used can be found in **Appendix 2**.

Second, the chapter uses estimates derived from survey data on the share and number of youth and adults in agriculture and off-farm agrifood systems, based on ad hoc tabulations provided by ILOSTAT.[viii] These data cover up to 77 countries and are, whenever applicable, disaggregated by gender and detailed age cohorts.

Third, some analyses in this chapter build on micro-level data produced by Davis *et al.*[ii] These data include data from up to 18 low– and lower-middle income countries on individual engagement in agrifood systems. These data have also been merged with geospatial data to analyse patterns of youth engagement along the rural opportunity space framework presented in **Chapter 2** (see **Spotlight 4.1**).

Notes: Refer to the **Notes section** for full citations.

YOUTH EMPLOYMENT IN AGRIFOOD SYSTEMS DECREASES WITH DEVELOPMENT

YOUTH EMPLOYMENT IN AGRIFOOD SYSTEMS

In 2021, approximately 44 percent of employed youth and 38 percent of employed adults were working in agrifood systems, compared with 54 percent of youth and 47 percent of adults in 2005 (Figure 4.1). This reduction in agrifood systems employment is explained primarily by the decline in agricultural employment in both age cohorts over this period.

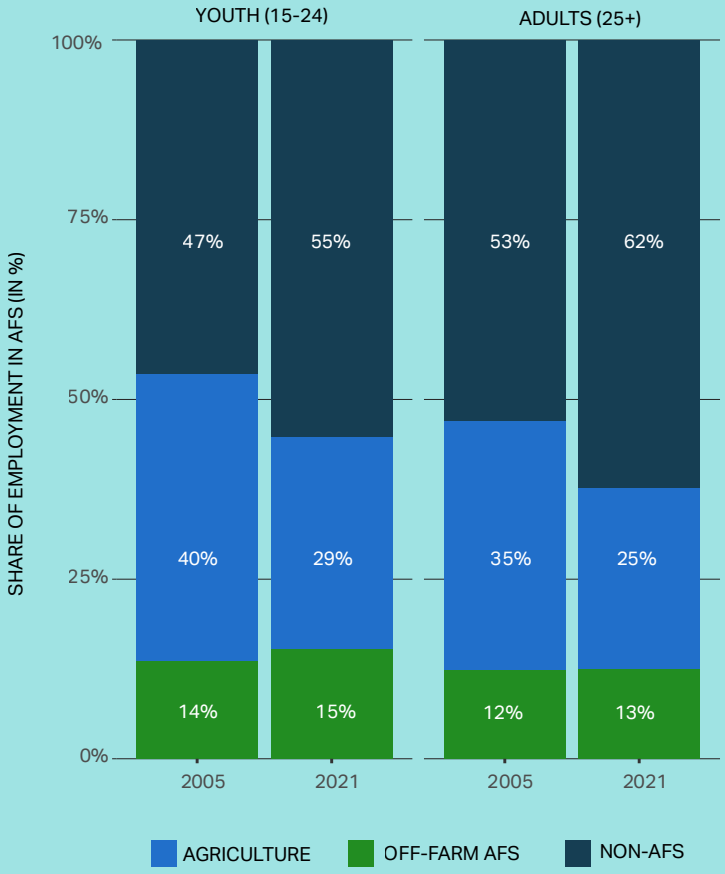
> **GLOBALLY, 44 PERCENT OF WORKING YOUTH WERE EMPLOYED IN AGRIFOOD SYSTEMS IN 2021.**

©FAO/TANG CHHIN SOTHY IN KAMPONG CHHNANG, CAMBODIA, 17-YEAR-OLD CHHUM KIMSEAK WRITES ON THE BOARD DURING CLASS AT HER SCHOOL IN KOUK BANTEAY COMMUNE, HIGHLIGHTING THE ROLE OF EDUCATION IN EMPOWERING RURAL YOUTH.

FIGURE 4.1

EMPLOYMENT IN AGRIFOOD SYSTEMS REMAINS IMPORTANT FOR YOUTH

Share of agrifood systems employment in total employment in 2005 and 2021, by age cohort



Note: Shares for youth do not amount to 100 percent due to rounding. Graph based on data from 136 countries: *Sub-Saharan Africa*: Burundi, Benin, Burkina Faso, Botswana, Cape Verde, Comoros, Côte d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Swaziland, United Republic of Tanzania, Togo, Uganda, Zambia, Zimbabwe. *Southern Asia*: Afghanistan, Bangladesh, India, Iran (Islamic Republic of), Nepal, Pakistan, Sri Lanka. *Southeastern Asia*: Cambodia, Indonesia, Lao People's Democratic, Republic, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam. *Eastern Asia*: China, Japan, Korea (Republic of), Mongolia. *Central Asia*: Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan. *Western Asia*: Azerbaijan, Cyprus, Georgia, Iraq, Israel, Jordan, Lebanon, Oman, Palestine, Saudi Arabia, Türkiye, United Arab Emirates. *Northern Africa*: Algeria, Egypt, Morocco, Tunisia. *Latin America and the Caribbean*: Argentina, Bahamas, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay. *Oceania*: Australia, Fiji, New Zealand. *Europe and Northern America*: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Denmark, Germany, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova (Republic of), Netherlands (Kingdom of the), North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.

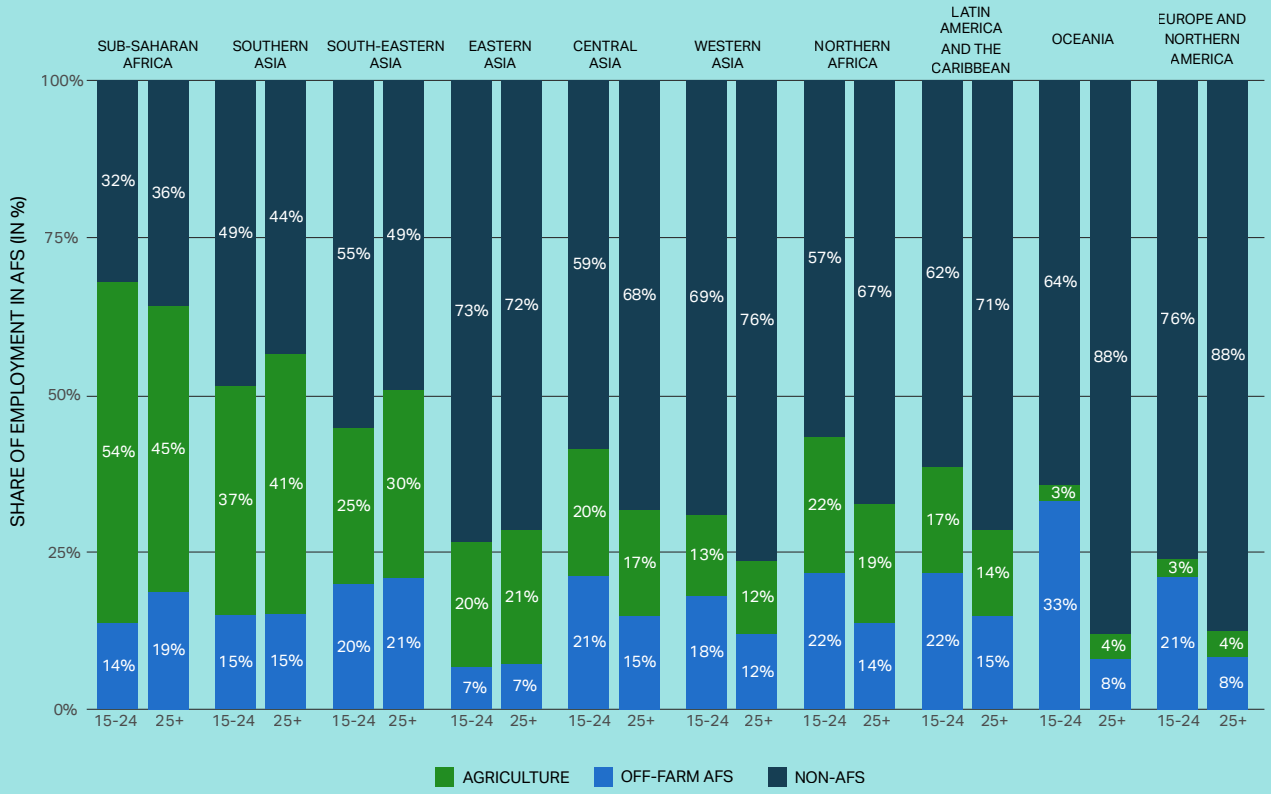
Looking first at youth employment in agrifood systems by region (Figure 4.2), the largest shares are found in sub-Saharan Africa and South Asia, with 68 percent and 52 percent, respectively. Most of these youth are working in agriculture.[5] In more developed countries, including from Southeastern Asia and Latin America and the Caribbean, while relatively larger shares of employed youth work in agrifood systems (45 percent and 39 percent, respectively), a greater portion of youth work off-farm in agrifood systems. In higher-income countries, with lower shares of rural youth in their populations, such as Europe and Northern America, less than a quarter of employed youth work in agrifood systems, mostly off-farm. In Oceania and Europe and Northern America, the share of youth employed in agrifood systems is more than double that of adults.

©IFAD/ANDREW ESIEBO IN OVIA NORTH, EDO STATE, NIGERIA, AIGBOKHAE OSIFO EFOSAS STANDS PROUDLY WITH HIS CHICKEN FEED IN THE POULTRY PENS, WHICH TRANSFORMED HIM FROM AN UNEMPLOYED YOUTH INTO A THRIVING ENTREPRENEUR.

FIGURE 4.2

AGRIFOOD SYSTEMS ARE A KEY SOURCE OF EMPLOYMENT FOR YOUTH IN AFRICA AND SOUTHERN ASIA

Share of agrifood systems employment in total employment in 2021, by age cohort and region



Note: Shares for youth do not amount to 100 percent due to rounding. Graph based on data from 136 countries: *Sub-Saharan Africa*: Burundi, Benin, Burkina Faso, Botswana, Cape Verde, Comoros, Côte d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Swaziland, United Republic of Tanzania, Togo, Uganda, Zambia, Zimbabwe. *Southern Asia*: Afghanistan, Bangladesh, India, Iran (Islamic Republic of), Nepal, Pakistan, Sri Lanka. *Southeastern Asia:* Cambodia, Indonesia, Lao People's Democratic, Republic, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam. *Eastern Asia:* China, Japan, Korea (Republic of), Mongolia. *Central Asia*: Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan. *Western Asia:* Azerbaijan, Cyprus, Georgia, Iraq, Israel, Jordan, Lebanon, Oman, Palestine, Saudi Arabia, Türkiye, United Arab Emirates. *Northern Africa*: Algeria, Egypt, Morocco, Tunisia. *Latin America and the Caribbean*: Argentina, Bahamas, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay. *Oceania*: Australia, Fiji, New Zealand. *Europe and Northern America*: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Denmark, Germany, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova (Republic of), Netherlands (Kingdom of the), North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.

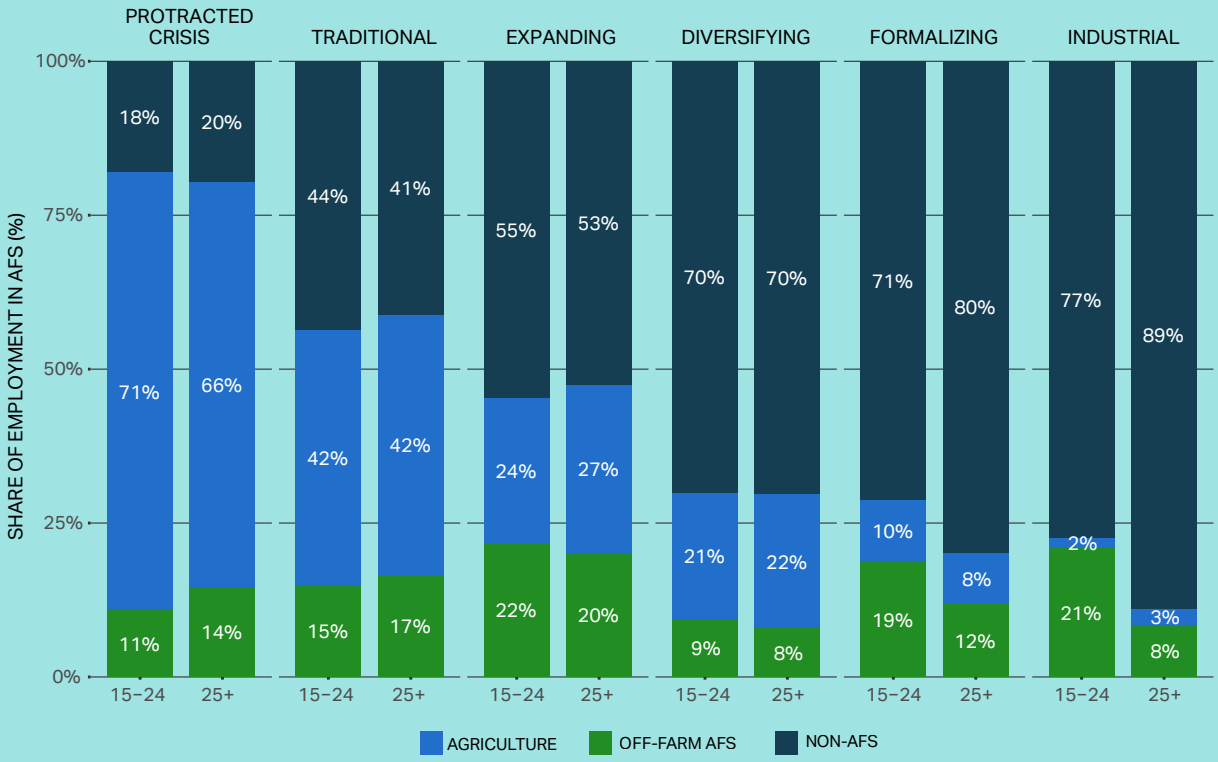
Youth employment in agrifood systems decreases as agrifood systems transition (Figure 4.3). The share of agrifood systems employment for youth ranges from 82 percent in protracted crisis agrifood systems to 57 percent in traditional agrifood systems, and 46 percent in expanding agrifood systems. The importance of agrifood systems for youth employment, as well for adults, continues to decline, with 30 percent of employed youth in diversifying agrifood systems, 29 percent in formalizing agrifood systems, and 23 percent in industrial agrifood systems.

©FAO/GIULIO NAPOLITANO IN AKASSATO, BENIN, DANIEL NARCISE SAVI, A YOUNG AGRIBUSINESS PROFESSIONAL, STANDS AT THE ALITECH FACTORY, REPRESENTING A NEW GENERATION DRIVING PRIVATE SECTOR INNOVATION IN AGRICULTURE.

FIGURE 4.3

AGRIFOOD SYSTEMS ARE A CRITICAL SOURCE OF EMPLOYMENT FOR YOUTH IN LESS FORMALIZED AGRIFOOD SYSTEM CATEGORIES

Share of agrifood systems employment in total employment in 2021, by age cohort and type of agrifood system



Note: Graph based on data from 136 countries: *Protracted crisis*: Afghanistan, Burundi, Ethiopia, Haiti, Mali, Mauritania, Niger, Palestine, Zimbabwe. *Traditional*: Bangladesh, Benin, Burkina Faso, Cambodia, Comoros, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, India, Kenya, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mozambique, Myanmar, Nepal, Nigeria, Pakistan, Rwanda, Senegal, Tajikistan, United Republic of Tanzania, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Azerbaijan, Bolivia (Plurinational State of), Botswana, Cape Verde, Egypt, El Salvador, Gambia, Georgia, Guatemala, Honduras, Indonesia, Iraq, Kyrgyzstan, Morocco, Namibia, Nicaragua, Paraguay, Peru, Philippines, Sri Lanka, Swaziland, Thailand, Uzbekistan, Viet Nam. *Diversifying*: Algeria, Belize, Bosnia and Herzegovina, China, Ecuador, Fiji, Guyana, Iran (Islamic Republic of), Jamaica, Kazakhstan, Lebanon, Mauritius, Moldova (Republic of), Mexico, Panama, Poland, Romania, Suriname, Trinidad and Tobago, Tunisia, Ukraine, South Africa. *Formalizing*: Albania, Argentina, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Cyprus, Dominican Republic, Hungary, Ireland, Jordan, Latvia, Lithuania, Malaysia, Mongolia, North Macedonia, Oman, Portugal, Russian Federation, Saudi Arabia, Slovakia, Slovenia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Bahamas, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea (Republic of), Luxembourg, Malta, Netherlands (Kingdom of the), New Zealand, Norway, Spain, Sweden, Switzerland, Uruguay, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.

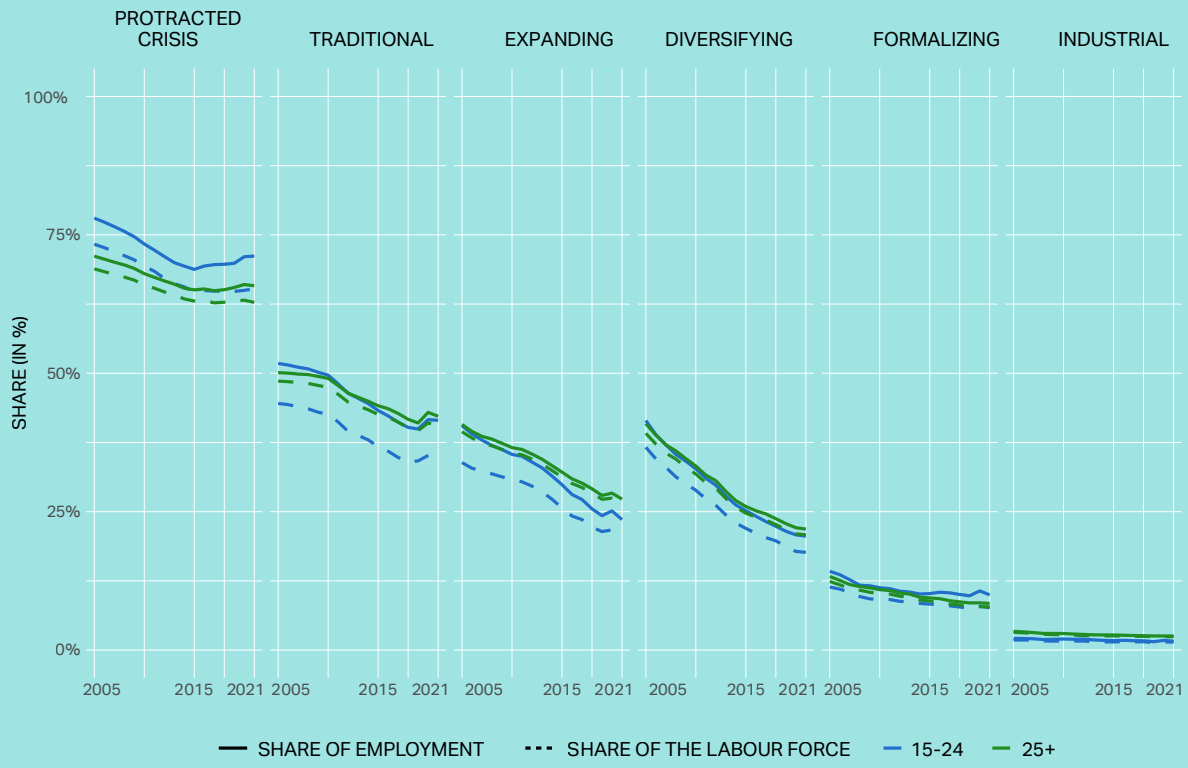
Youth and adult employment in agrifood systems follow similar patterns as agrifood systems transition. This process is driven mainly by adults and youth moving out of agriculture as countries structurally transform (Figure 4.4). In all types of agrifood systems the share of youth and adults in agricultural employment out of all youth and adults in employment and in the labour force declined over time, with similar trajectories between youth and adults.

©IFAD/GIULIO NAPOLITANO IN ATHIEME, BENIN, YOUNG COOPERATIVE LEADER ADELE GOGOE SERVES AS SECRETARY OF THE LOCAL MAIZE PRODUCERS' UNION, EXEMPLIFYING YOUTH LEADERSHIP IN STRENGTHENING COMMUNITY-BASED AGRIFOOD SYSTEMS.

FIGURE 4.4

YOUTH AND ADULTS IN EMPLOYMENT AND THE LABOUR FORCE EXIT AGRICULTURE AT A SIMILAR PACE

Share of adults and youth employment and labour force in agriculture between 2005 and 2021, by agrifood system type



Note: Graph based on data from 136 countries: *Protracted crisis:* Afghanistan, Burundi, Ethiopia, Haiti, Mali, Mauritania, Niger, Palestine, Zimbabwe. *Traditional*: Bangladesh, Benin, Burkina Faso, Cambodia, Comoros, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, India, Kenya, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mozambique, Myanmar, Nepal, Nigeria, Pakistan, Rwanda, Senegal, Tajikistan, United Republic of Tanzania, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Azerbaijan, Bolivia (Plurinational State of), Botswana, Cape Verde, Egypt, El Salvador, Gambia, Georgia, Guatemala, Honduras, Indonesia, Iraq, Kyrgyzstan, Morocco, Namibia, Nicaragua, Paraguay, Peru, Philippines, Sri Lanka, Swaziland, Thailand, Uzbekistan, Viet Nam. *Diversifying*: Algeria, Belize, Bosnia and Herzegovina, China, Ecuador, Fiji, Guyana, Iran (Islamic Republic of), Jamaica, Kazakhstan, Lebanon, Mauritius, Moldova (Republic of), Mexico, Panama, Poland, Romania, Suriname, Trinidad and Tobago, Tunisia, Ukraine, South Africa. *Formalizing*: Albania, Argentina, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Cyprus, Dominican Republic, Hungary, Ireland, Jordan, Latvia, Lithuania, Malaysia, Mongolia, North Macedonia, Oman, Portugal, Russian Federation, Saudi Arabia, Slovakia, Slovenia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Bahamas, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea (Republic of), Luxembourg, Malta, Netherlands (Kingdom of the), New Zealand, Norway, Spain, Sweden, Switzerland, Uruguay, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.s

Multiple factors explain this exit from agriculture. The structural transformation process, characterized by increases in labour productivity and increased income and demand in non-food products and services, typically results in a shifting of the workforce into more stable and better paying jobs in the secondary and tertiary sectors.[5,14] As can be seen in Figure 4.4, countries with less formalized agrifood systems are at an earlier stage of this process but have experienced more rapid declines in agricultural employment, affecting both youth and adults. Along with these economic shifts, multiple factors have played a critical role in shaping labour markets and youth engagement in agriculture, such as negative perceptions of work in agriculture,[15–17] limited access to land,[18–21] and other inputs as well as increased educational attainment, all of which have reshaped youth aspirations and capacity to pursue jobs in the off-farm sector associated with better income and opportunities[15] (see Spotlight 1.1 and Chapter 3).

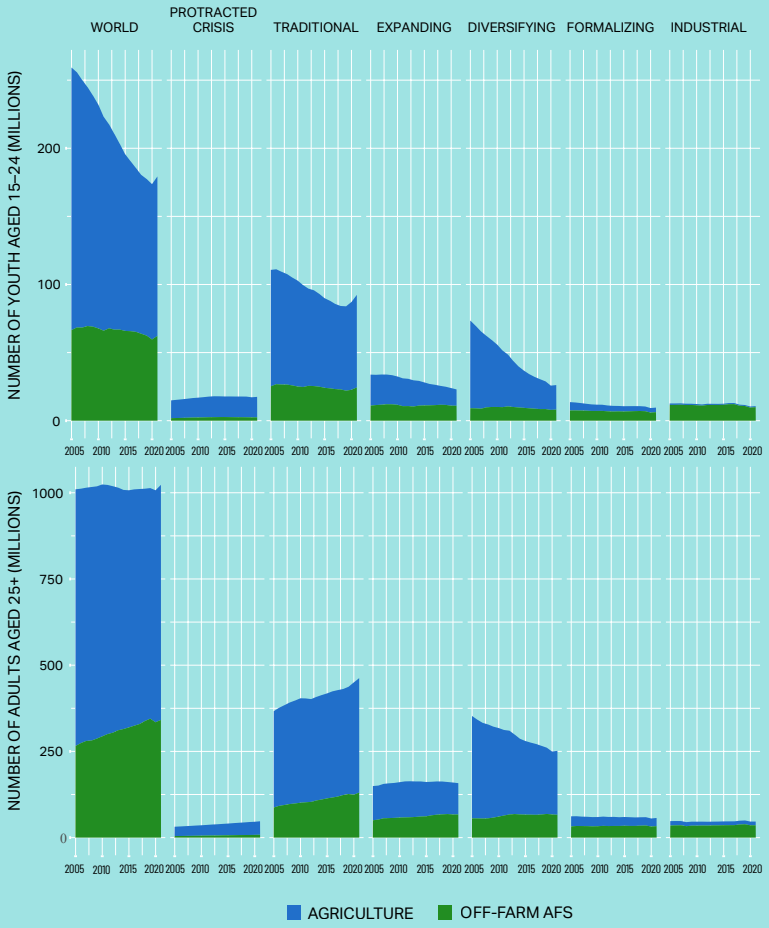
While the share of agriculture and broader agrifood systems employment declines as agrifood systems transition, this employment remains critical for large numbers of youth and adults, especially in less formalized agrifood systems (Figure 4.5). Globally, while the number of adults working in agrifood systems has remained stable between 2005 and 2021, the number of youth employed in the sector, both in agriculture and off-farm segments of agrifood systems, has declined during the same period. This decline is driven mostly by large decreases in countries with diversifying agrifood systems. For example, China has experienced a decrease in the number of workers in agriculture.[22,23] While the number of young workers in agrifood systems has declined over time in traditional agrifood systems, this number has remained more stable in other types of agrifood systems. In countries with large youth populations, especially with traditional agrifood systems, agrifood systems still provide employment opportunities to a large number of youth entering labour markets.

©FAO/LUIS TATO IN KIAMBU COUNTY, KENYA, RUTH WANJIRU MBURU AND GRACE WANJIRA KANGHETE FEED THEIR KIENYEJI CHICKENS ON A YOUTH-RUN FARM, SHOWCASING HOW AGRIBUSINESS TRAINING IS CREATING LOCAL OPPORTUNITIES AND ALTERNATIVES TO MIGRATION FOR RURAL YOUTH.

FIGURE 4.5

AGRIFOOD SYSTEMS EMPLOYMENT DECLINES BUT REMAINS CRITICAL FOR MANY WORKERS IN LESS FORMALIZED AGRIFOOD SYSTEMS

Number of workers in agrifood systems between 2005 and 2021, by sector and agrifood system type



Notes: Graph based on data from 131 countries: *Protracted crisis*: Afghanistan, Burundi, Ethiopia, Haiti, Mali, Mauritania, Palestine, Zimbabwe. *Traditional*: Benin, Burkina Faso, Bangladesh, Cambodia, Comoros, Côte d'Ivoire, Ghana, Guinea-Bissau, India, Kenya, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mozambique, Myanmar, Nepal, Nigeria, Pakistan, Senegal, United Republic of Tanzania, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Azerbaijan, Bolivia (Plurinational State of), Botswana, Cape Verde, Egypt, El Salvador, Gambia, Georgia, Guatemala, Honduras, Indonesia, Iraq, Kyrgyzstan, Morocco, Namibia, Nicaragua, Paraguay, Peru, Philippines, Swaziland, Thailand, Uzbekistan, Viet Nam. *Diversifying*: Algeria, Belize, Bosnia and Herzegovina, China, Ecuador, Fiji, Guyana, Iran (Islamic Republic of), Jamaica, Kazakhstan, Lebanon, Mauritius, Moldova (Republic of), Mexico, Panama, Poland, Romania, Suriname, Trinidad and Tobago, Tunisia, Ukraine, South Africa. *Formalizing*: Albania, Argentina, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Cyprus, Dominican Republic, Hungary, Ireland, Jordan, Latvia, Lithuania, Malaysia, Mongolia, North Macedonia, Oman, Portugal, Russian Federation, Saudi Arabia, Slovakia, Slovenia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Bahamas, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea (Republic of), Luxembourg, Malta, Netherlands (Kingdom of the), New Zealand, Norway, Spain, Sweden, Switzerland, Uruguay, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.

YOUTH SHARES OUT OF ALL AGRIFOOD SYSTEMS WORKERS ARE LINKED TO AGRIFOOD SYSTEMS TRANSITION

Globally, youth constitute 15 percent of all agrifood systems workers, although this share varies as agrifood systems transition (Figure 4.6). In countries with protracted crises, about a quarter of agrifood systems workers and almost 30 percent of agricultural workers are aged 15–24. The share of youth among all agrifood systems workers declines as agrifood systems transition, reaching 9 percent in emerging agrifood systems. In modernizing and industrial agrifood systems, the share of agrifood systems workers categorized as youth increases to 15 percent and 20 percent, respectively, driven primarily by increasing shares of youth among off-farm agrifood systems workers. In industrial agrifood systems, youth account for only 7 percent of agriculture workers, reflecting the aging of the agriculture sector.[9, 13, 24]

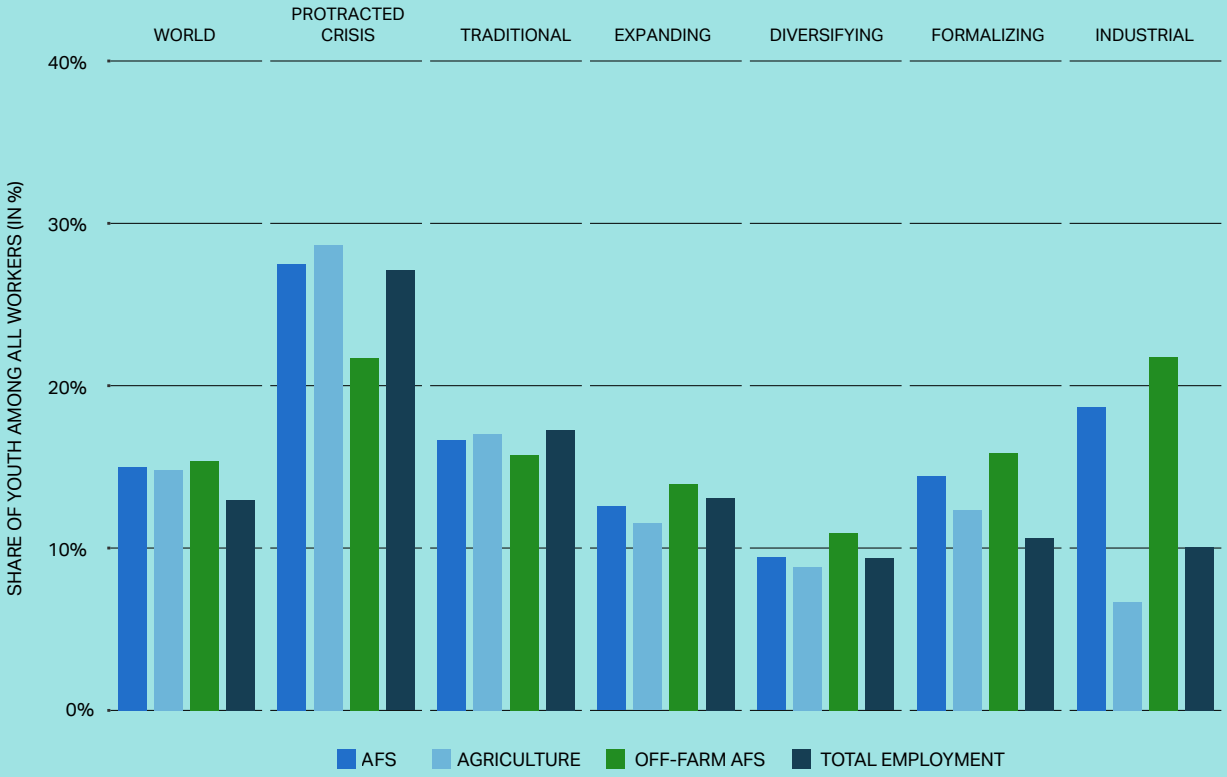
> “YOUTH REPRESENT 15 PERCENT OF ALL AGRIFOOD SYSTEMS WORKERS IN THE WORLD.

©FAO/SAIKAT MOJUMDE IN BRAHMANBARIA, BANGLADESH, A YOUNG MEMBER OF A COMMUNITY-BASED ORGANIZATION TRANSPORTS HARVESTED FISH TO A NEARBY MARKET AFTER FOUR MONTHS OF FLOATING CAGE AQUACULTURE, DEMONSTRATING YOUTH-LED INNOVATION IN SUSTAINABLE FISH FARMING.

FIGURE 4.6

ABOUT 15 PERCENT OF AGRIFOOD SYSTEMS WORKERS ARE YOUTH, ALTHOUGH SHARES DIFFER BY AGRIFOOD SYSTEM TYPE

Share of youth out of all agrifood systems workers in 2021, by agrifood system type and sector



Notes: Graph based on data from 136 countries: *Protracted crisis*: Afghanistan, Burundi, Ethiopia, Haiti, Mali, Mauritania, Niger, Palestine, Zimbabwe. *Traditional*: Bangladesh, Benin, Burkina Faso, Cambodia, Comoros, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, India, Kenya, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mozambique, Myanmar, Nepal, Nigeria, Pakistan, Rwanda, Senegal, Tajikistan, United Republic of Tanzania, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Azerbaijan, Bolivia (Plurinational State of), Botswana, Cape Verde, Egypt, El Salvador, Gambia, Georgia, Guatemala, Honduras, Indonesia, Iraq, Kyrgyzstan, Morocco, Namibia, Nicaragua, Paraguay, Peru, Philippines, Sri Lanka, Swaziland, Thailand, Uzbekistan, Viet Nam. *Diversifying*: Algeria, Belize, Bosnia and Herzegovina, China, Ecuador, Fiji, Guyana, Iran (Islamic Republic of), Jamaica, Kazakhstan, Lebanon, Mauritius, Moldova (Republic of), Mexico, Panama, Poland, Romania, Suriname, Trinidad and Tobago, Tunisia, Ukraine, South Africa. *Formalizing*: Albania, Argentina, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Cyprus, Dominican Republic, Hungary, Ireland, Jordan, Latvia, Lithuania, Malaysia, Mongolia, North Macedonia, Oman, Portugal, Russian Federation, Saudi Arabia, Slovakia, Slovenia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Bahamas, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea (Republic of), Luxembourg, Malta, Netherlands (Kingdom of the), New Zealand, Norway, Spain, Sweden, Switzerland, Uruguay, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration, using ILO estimates based on ILO modelled estimates, November 2023. These estimates provide the share of youth among all agricultural workers. The share and number of youth in agriculture and off-farm agrifood systems employment were modelled, adapting an approach used by Davis *et al.*[1] and detailed in Appendix 2.

Figure 4.7 provides the age distribution of workers in agrifood systems by more granular age cohorts and gender using non-modelled data. Among men, agrifood systems in protracted crisis have the most youthful structure, with the largest share of workers found in the 15–24 age category, followed by those aged 25–34 and 35–44. Across agrifood systems transition, except for industrial agrifood systems, young men constitute a larger share of agrifood systems workers, reflecting lower levels of female labour force participation. In all other age cohorts, male workers consistently represent larger shares of agrifood systems workers than their female counterparts.

Within agrifood system types, countries have substantial heterogeneity in the share of youth among all agrifood systems workers. In all countries with protracted crises in the sample (Ethiopia, Mali, Palestine, South Sudan and Zimbabwe) and several countries with traditional agrifood systems (Madagascar, Pakistan, Uganda and Zambia), many of which have large youth populations (see Figure 2.4 in Chapter 2), youth represent about one-quarter of all agrifood systems workers. Among diversifying agrifood systems, nearly 20 percent of agrifood systems workers are aged 15–24 in Ecuador, Mexico and Panama, while in expanding agrifood systems, more than 20 percent of agrifood systems workers are aged 15–24 in Angola, the Gambia, Guatemala, Honduras, Iraq, Kyrgyzstan and Peru. In industrial agrifood systems, while youth represent a minor share of agrifood systems workers in Japan (5 percent) or Greece (6 percent), they account for 29 percent and 36 percent of all agrifood systems workers in Israel and Australia, respectively.

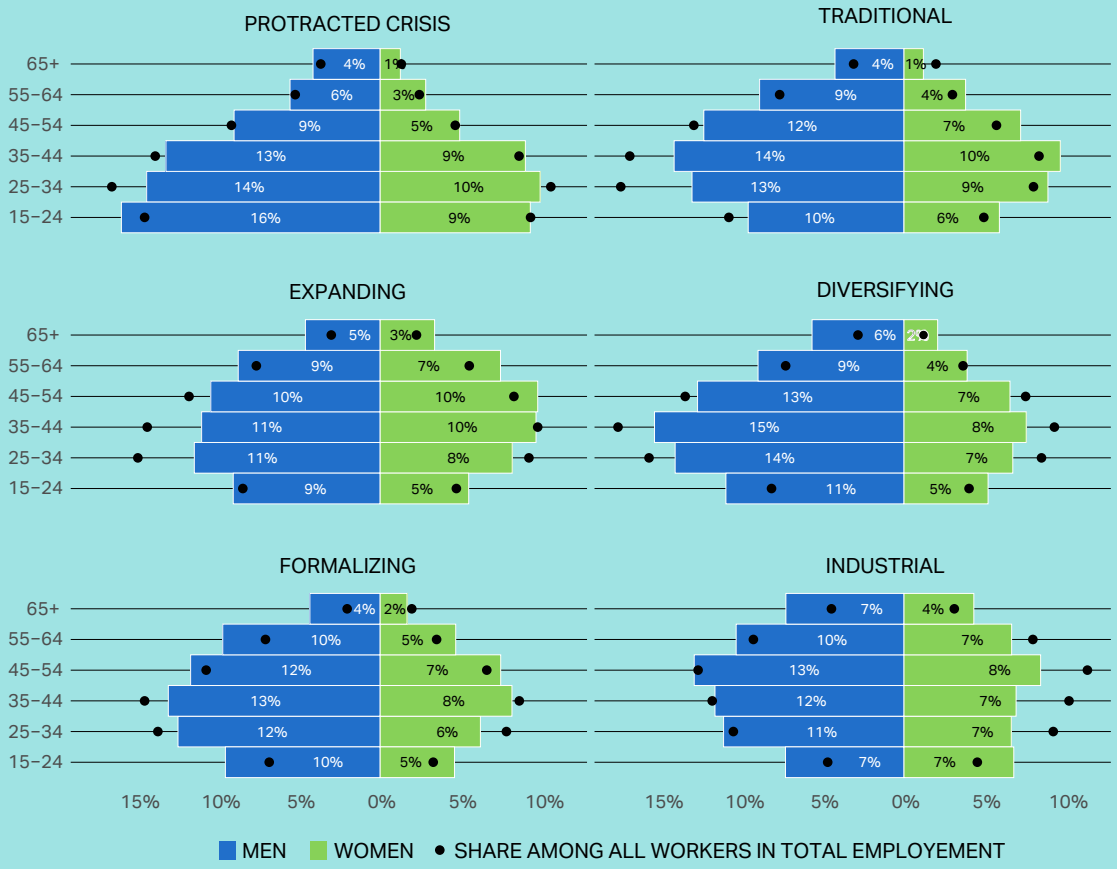
While the contribution of youth to agrifood systems employment decreases as agrifood systems transition, youth remain over-represented in the sector. With the exception of young men in traditional agrifood systems, the shares of youth among workers in agrifood systems is larger than their shares in total employment in almost all settings, making agrifood systems more reliant on youth than other sectors.

©FAO/NASTYA PALAGUTINA IN ASTANA, KAZAKHSTAN, A YOUNG LABORATORY WORKER PREPARES RAW MILK SAMPLES FOR TESTING, CONTRIBUTING TO FOOD SAFETY AND QUALITY ASSURANCE IN THE DAIRY VALUE CHAIN.

FIGURE 4.7

YOUTH ARE OVERREPRESENTED IN ALMOST ALL AGRIFOOD SYSTEMS TYPES

Share of different age cohorts out of all agrifood systems workers and total employment in 2021, by agrifood system type and gender



Note: Graph based on data from 72 countries: *Protracted crisis*: Afghanistan, Ethiopia, Mali, Palestine, Sudan, Zimbabwe. *Traditional*: Bangladesh, Burkina Faso, Cambodia, Comoros, Guinea-Bissau, India, Lao People's Democratic Republic, Madagascar, Nigeria, Pakistan, Papua New Guinea, Rwanda, Senegal, Timor-Leste, Togo, Uganda, Zambia. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, Panama, South Africa, Tunisia. *Expanding*: Angola, Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Eswatini, Gambia, Georgia, Guatemala, Honduras, Iraq, Kyrgyzstan, Peru, Samoa, Sri Lanka, Thailand, Viet Nam, *Formalizing*: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Saudi Arabia, Slovakia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Czechia, France, Greece, Israel, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

The decline of youth's share in agrifood systems is linked to a drop in the share of youth among all agricultural workers. While there are no major changes within agrifood system types, which have maintained overall similar demographic structures among agricultural workers, different regions have seen a substantial decline in the shares of youth among all agricultural workers (see Figure A5.2 in Appendix 5). Sub regions in Asia have experienced the sharpest declines, whereas in sub-Saharan Africa, the decline has been more gradual, with youth representation decreasing by about 2 percentage points over the last two decades. As both youth and adults leave agriculture at a similar pace, including proportionately to their levels of development,[5,25] agriculture relies more extensively on adult workers as agrifood systems transition.

While overall trends show a decrease in the role of youth in agriculture, the share of youth among agriculture workers increased in some countries, such as Angola (from 21 percent to 29 percent), Uganda (from 31 percent to 36 percent) and Ecuador (from 19 percent to 22 percent) (Table A5.1 in Appendix 5). This may be due to the increased participation of youth in agriculture in low-income and lower-middle-income countries after the onset of the COVID-19 pandemic, as well as the success of agricultural interventions in promoting youth employment, such as land titling, farmer school programmes and other programmes that aim to shape youth's perceptions of agricultural employment.[26–28] In many industrialized agrifood systems, the share of young workers in the sector also increased (e.g. from 6 percent to 9 percent in France), which could be linked to clearer farm succession plans,[29] the presence of young farmers in these agrifood systems[26, 30] or highly specialized agricultural activities.

MANY YOUTH LEAVE AGRICULTURE FOR SCHOOL

Different patterns emerge regarding young people's paths when they exit agriculture (Figure 4.8). In countries with less formalized agrifood systems, the drop in the share of working-age youth employed in agriculture between 2012 and 2021 coincided with an increase in the share of youth in school. For example, in countries with protracted crisis agrifood systems, the share of young working-age women and men declined by 17 and 15 percentage points, respectively, while the share of those in school increased by 11 and 9 percentage points. A similar trend is observed in countries with traditional and expanding agrifood systems. These trends reflect the progress made in educational attainment in these countries, especially as they catch up with more formalized agrifood systems (see Chapter 3).

Young women are also catching up with young men. Across agrifood system types, greater shares of young women were engaged in school in 2021 than in 2012. In fact, a greater share of young women were in school in 2021 compared to young men across expanding, diversifying, formalizing and industrial agrifood systems.

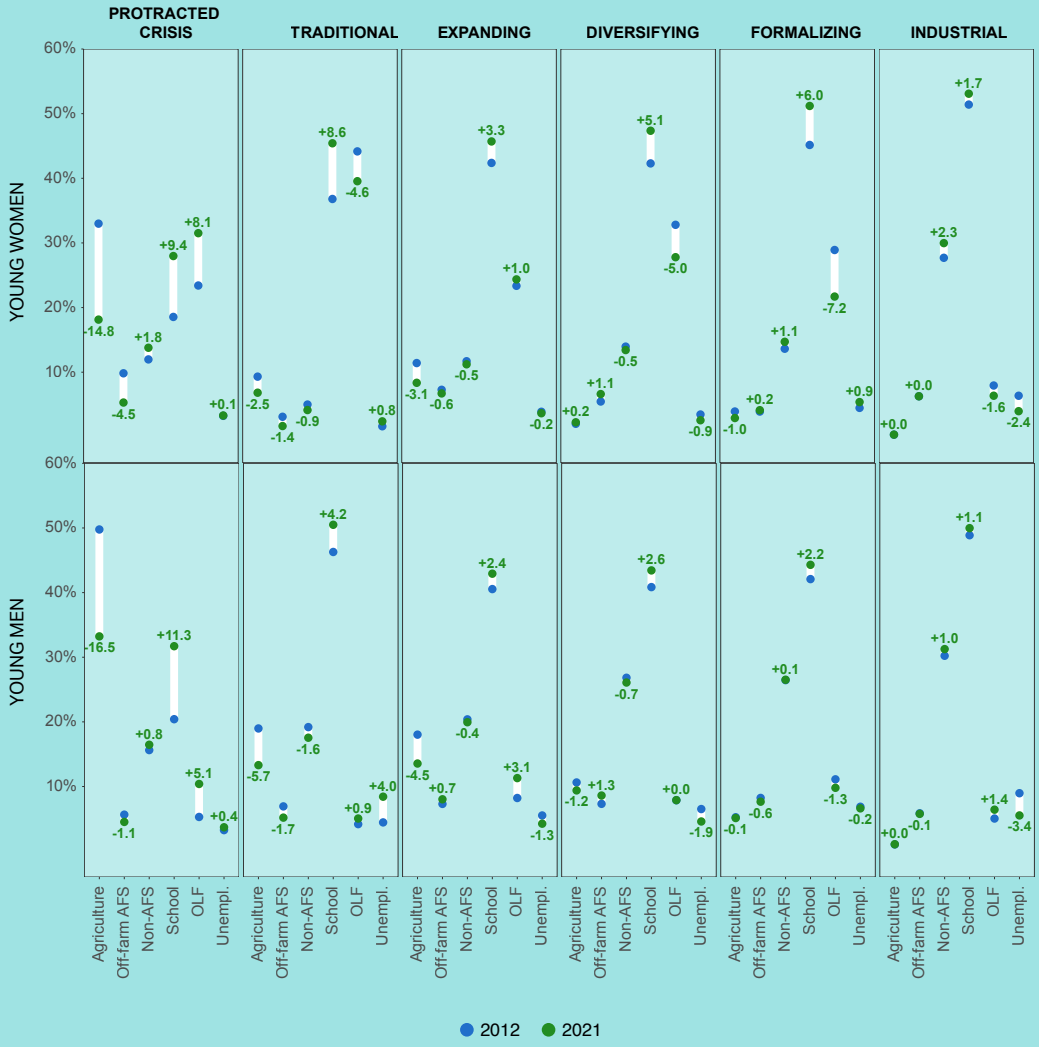
Young women, however, remain much more likely to be outside of the labour force and not in school than young men across all agrifood system types, except industrial agrifood systems (see Chapter 3). The high proportion of young women outside of the labour force who are not in school may be linked to gender norms that constrain women's choices and impose expectations that they engage in unpaid work.[31,32] This makes them more vulnerable to being pushed out of the labour force during crises.[32]

"THE DECLINE IN YOUTH'S SHARE IN AGRIFOOD SYSTEMS IS LINKED TO A DECLINING SHARE OF YOUTH IN AGRICULTURE.

FIGURE 4.8

DECLINE IN THE SHARE OF YOUTH EMPLOYED IN AGRICULTURE COINCIDES WITH AN INCREASE IN SCHOOL PARTICIPATION

Status of working-age youth in 2012 and 2021, by agrifood system type



Note: The graph shows the distribution of working-age population between 2012 (or the nearest year within a three-year band) and 2021, disaggregated by age and gender cohorts. The changes between 2012 and 2021 do not always add up to 100 due to rounding. Graph based on data from 37 countries: *Protracted crisis*: Afghanistan, Ethiopia, Palestine, Zimbabwe. *Traditional*: Comoros, Cambodia, India, Timor-Leste, Uganda. *Expanding*: Angola, Bolivia, Egypt, El Salvador, Kyrgyzstan, Peru, Thailand, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico. *Formalizing*: Albania, Argentina, Dominican Republic, Mongolia, North Macedonia, Portugal, Slovakia, Türkiye. *Industrial*: Austria, Czechia, Greece, France, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration. The shares of youth employed in agriculture, off-farm agrifood systems and outside agrifood systems are based on ILO Harmonized Microdata, https://ilostat.ilo.org. The shares of youth in school, outside the labour force and unemployed were calculated based on annual data from the ILOSTAT and YouthSTATS databases.

AGRIFOOD SYSTEMS REMAIN KEY FOR YOUTH

AGRIFOOD SYSTEMS AS A CRITICAL ENTRY POINT FOR YOUTH EMPLOYMENT

While youth employment in agrifood systems declines with development and agrifood systems transition, agrifood systems remain a critical entry point for youth (Figure 4.9).[33, 34] The youngest category of men (15–19 years of age) relies more on agrifood systems employment than youth aged 20–24 across all levels of agrifood systems transition. This is also true for young women, except in the case of traditional agrifood systems. For example, in protracted crisis agrifood systems, 76 percent and 66 percent of men and women, respectively, aged 15–19 rely on agrifood systems employment, compared with 66 percent and 63 percent of men and women, respectively, aged 20–24. The percentages decrease moving from protracted crisis to industrial food systems, where 25 percent of men and 29 percent of women aged 15–19 are in agrifood systems employment, compared to 13 percent of men and 12 percent of women aged 20–24.

In the first three types of agrifood system transition, younger youth rely extensively on agriculture for their livelihoods, with engagement in own farming being the most direct entry point for those living in farm-owning households,[33, 34] an involvement that in some cases started much earlier in childhood.[35] This is particularly true for youth aged 15–17, who have reached the legal minimum age for employment and rely extensively on agrifood systems.[36]

At the same time, the share of youth aged 15–19 and 20–24 employed in off-farm agrifood systems employment increases, particularly for young women, in expanding agrifood systems (31 percent of young women aged 15–19 and 24 percent of young women aged 20–24, compared to 18 percent of young men aged 15–19 and 19 percent of young men aged 20–24, respectively), diversifying agrifood systems (39 percent versus 21 percent and 24 percent versus 18 percent, respectively) and industrial agrifood systems (27 percent of young women aged 15–19 versus 23 percent of young men aged 15–19).

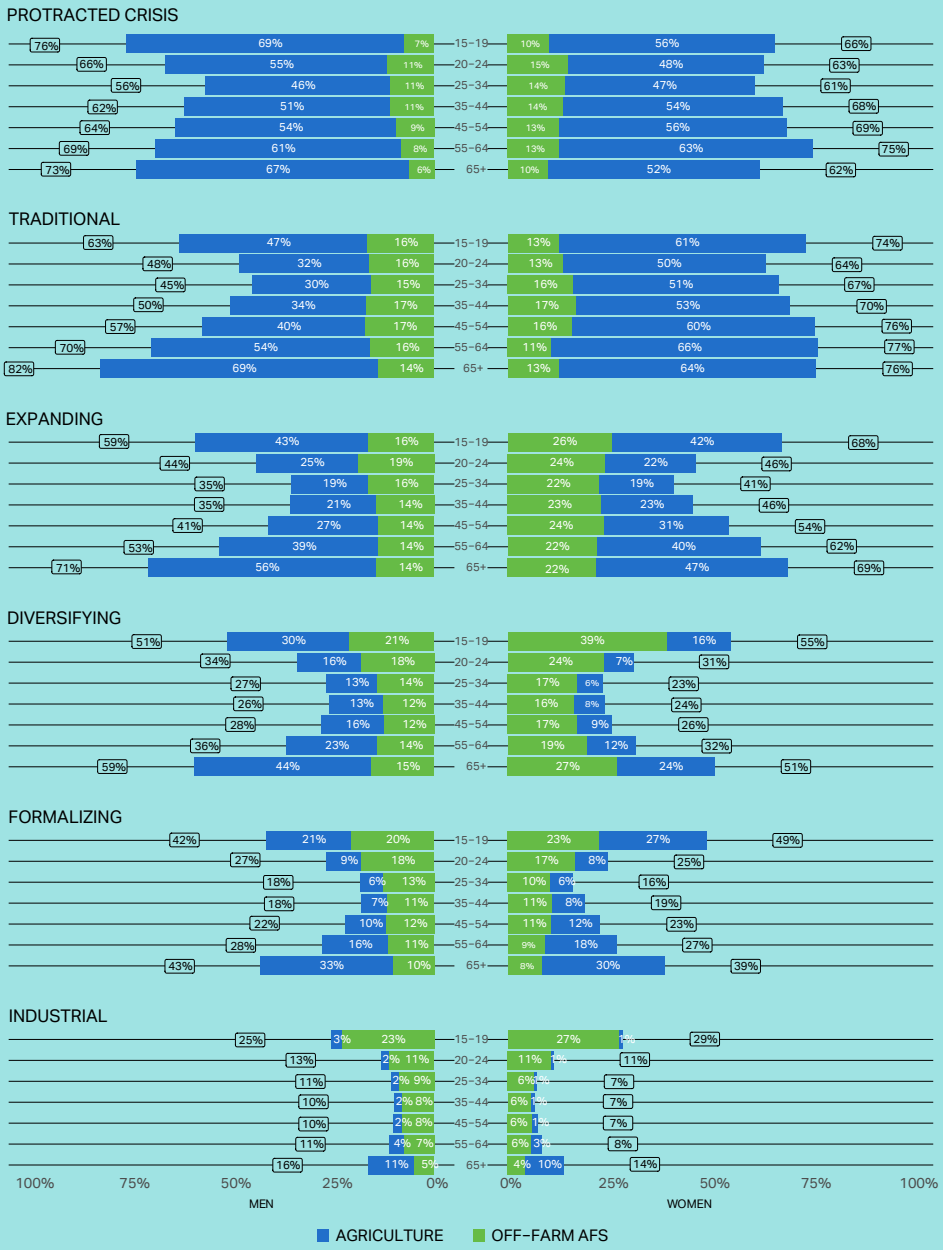
Variation in agrifood systems employment by age cohort is "C"-shaped across all types of agrifood system transition, except for women in protracted crisis agrifood systems. Following initial high levels, as individuals age, smaller shares are employed in agrifood systems employment until the 35–44 age cohort, at which point both women and men return to agrifood systems employment. As agrifood systems transition, the youngest cohort increasingly works on off-farm agrifood systems employment, while the oldest cohort focuses on agriculture.

> **"AGRIFOOD SYSTEMS, ESPECIALLY AGRICULTURE, ARE KEY SOURCES OF LIVELIHOODS FOR YOUNGER YOUTH (15-19).**

FIGURE 4.9

AGRIFOOD SYSTEMS ARE A MAJOR ENTRY POINT FOR YOUNGER YOUTH, BUT YOUNG MEN EXIT AGRIFOOD SYSTEMS FASTER THAN YOUNG WOMEN

Share of workers in agrifood systems between 2005 and 2021, by sector and agrifood system type



Note: The shares of total agrifood system employment do not always add up to the sum of the shares of agricultural and off-farm agrifood system employment due to rounding. Graph based on data from 77 countries: *Protracted crisis*: Afghanistan, Ethiopia, Mali, Sudan, West Bank and the Gaza Strip, Zimbabwe. *Traditional*: Bangladesh, Burkina Faso, Cambodia, Comoros, Guinea-Bissau, India, Lao People's Democratic Republic, Madagascar, Nigeria, Pakistan, Papua New Guinea, Rwanda, Senegal, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Angola, Bolivia, Botswana, Egypt, El Salvador, Eswatini, Gambia, Georgia, Guatemala, Honduras, Iraq, Kyrgyz Republic, Peru, Samoa, Sri Lanka, Thailand, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, Panama, South Africa, Trinidad and Tobago, Tunisia. *Formalizing*: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Saudi Arabia, Slovak Republic, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Czechia, France, Greece, Israel, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

Agrifood systems remain a larger source of livelihoods for young women than young men across all agrifood system types. In protracted crisis and traditional agrifood systems, the youngest men are exiting the sector faster than young women (aged 15–19). Lower shares of working men aged 25–64 compared to women from the same age cohort work in protracted crisis, traditional, and expanding agrifood systems. In agrifood systems further along the transition process, that is diversifying, formalizing, and industrial agrifood systems, similar or slightly higher shares of men aged 25–64 are employed in agrifood systems, compared to their female counterparts. In protracted crisis and traditional agrifood systems, women's employment is at similarly (high) levels across age cohorts, stressing the importance of agrifood systems employment for women throughout their life cycle. A similar pattern is observed in spaces with severe challenges and limited economic opportunities, where women's livelihoods rely more extensively on agrifood systems (see Spotlight 4.1).

IMPORTANCE OF OFF-FARM AGRIFOOD SYSTEMS

Off-farm agrifood systems can provide employment opportunities that may be more accessible to youth.[33] These can be found on different segments of agrifood systems and involve firms of different sizes. As agrifood systems transition, more job opportunities are created in off-farm segments and the "hidden middle" of agrifood systems, in particular in small- and medium-sized enterprises (SMEs),[7, 37, 38] who dominate the midstream of agrifood systems,[37, 39] often supplied by small-scale farmers.[38] A review by Berdegué *et al.*[7] stresses that SMEs in agrifood systems represent important sources of employment for youth, who may also be attracted by the use of modern and new technologies in the sector.[7, 42, 43] However, in earlier stages of agrifood systems transition, many of these SMEs are informal and exhibit low productivity.[44–47] Evidence from Zimbabwe, for example, suggests that while many youth work in SMEs, such work often takes place in precarious circumstances.[48]

Globally, the share of youth among off-farm agrifood systems workers is 15 percent (Figure 4.6). Countries with protracted crisis and industrial agrifood systems display the highest shares of youth out of all off-farm agrifood systems workers (21 percent and 22 percent, respectively). In traditional agrifood systems, 16 percent of all off-farm agrifood systems workers are aged 15–24, but these shares decline slightly as agrifood systems transition, with 14 percent and 11 percent of youth among off-farm agrifood systems workers in informal and emerging agrifood systems, respectively. In modernizing agrifood systems, the share of youth among all off-farm agrifood systems workers increases to 16 percent.

In countries with protracted crisis and traditional agrifood systems, the share of youth among all off-farm agrifood systems workers is lower than the share of youth among all agriculture workers or out of all workers. Several factors may contribute to this, including limited access to financial resources, which hinders youth from pursuing education, training or entrepreneurial opportunities,[28, 34, 49] including in the off-farm sector. Increased educational attainment in more developed economies often leads to youth studying longer, but without corresponding access to relevant skills for off-farm jobs. Skills mismatch also plays a critical role (see Chapter 3), with discrepancies between the types and levels of education young people receive and the demands of the off-farm agrifood systems market. Inequitable access to quality education further exacerbates this issue, limiting opportunities for youth in rural areas or lower-income communities to transition successfully into the off-farm sector.[50, 51] In transitioning and industrial agrifood systems, youth shares among all workers are higher in off-farm agrifood systems employment, compared to agriculture and total employment.

Generally, off-farm agrifood system employment is a more critical source of livelihoods for women (Figure 4.9).[32, 52] Young women, particularly those aged 15–19, are more likely than young men to be employed in off-farm agrifood systems, except in contexts of protracted crisis (Figure 4.9). As agrifood systems transition, the significance of off-farm agrifood systems employment grows more rapidly for young women than for young men. For example, among women aged 15–19, its share increases from 10 percent in protracted crisis agrifood systems to 27 percent in industrial systems, while the share for young men increases from 7 percent in protracted crisis agrifood systems to 23 percent in industrial systems. In general, as youth get older, they tend to transition out of off-farm agrifood systems, with young women in general exiting the sector at

higher rates than young men as they approach young adulthood, especially in agrifood systems further along the transition process (Figure 4.9).

Off-farm agrifood systems also present greater livelihood opportunities for urban youth, compared to their rural peers and their adult counterparts in urban areas (Figure 4.10). Unsurprisingly, employment outside agrifood systems dominates in urban areas, in line with recent evidence.[33] Yet, non-negligible shares of employed urban youth rely on off-farm agrifood systems employment. In protracted crisis and traditional agrifood systems, approximately one in five employed youth in urban areas work in off-farm agrifood systems. The importance of off-farm agrifood systems in urban areas increases as agrifood systems transition. In expanding and diversifying agrifood systems, 22 percent of young employed urban men and 34 percent and 28 percent of young employed urban women, respectively, work in off-farm agrifood systems. This situation could reflect the fact that new job opportunities generated off-farm by the transition of agrifood systems, especially in SMEs, coupled with urbanization,[37,40] can benefit urban youth who are more likely to engage in non-farm employment.[7, 33] In formalizing and industrial agrifood systems, slightly lower shares of urban youth engage in off-farm agrifood systems employment, although they rely more on such employment than adults.

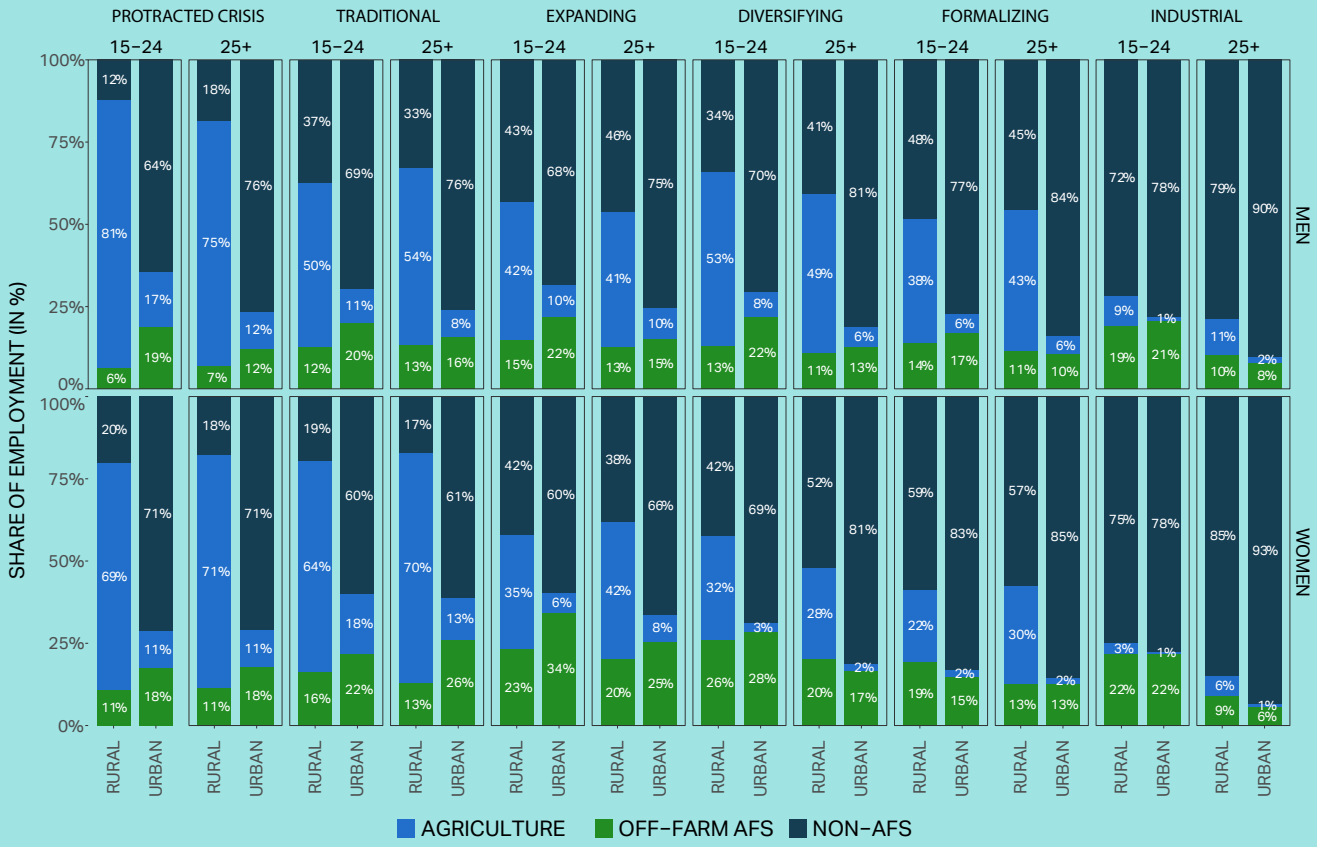
Figure 4.10 also shows a sharper decline in agricultural employment in rural areas as agrifood systems transition, although it also decreases in urban areas. In rural areas, off-farm agrifood systems employment is more important for young women than young men, across agrifood system types, compared to urban areas, except in industrial agrifood systems, where the shares are similar (21 percent and 22 percent, respectively). Many of the jobs created in SMEs that are located predominantly in urban areas remain linked to agriculture and primary production,[7] with urban centres connected to their surrounding areas.[53, 54] Yet, beyond the rural-urban dichotomy, understanding how agrifood system employment opportunities evolve along the rural-urban continuum is critical, taking into consideration the unequal services and opportunities available across different areas[54] (see Spotlight 4.1).

©FAO/CHRIS STEELE-PERKINS/ MAGNUM PH IN THE VILLAGE OF NARAPANI, NEPAL, RIPA THAPA PREPARES THE EVENING MEAL AT HOME WHILE HER HUSBAND WORKS ABROAD. CLIMATE-SMART AGRICULTURE INITIATIVES HELP YOUNG FAMILIES LIKE HERS ADAPT TO CLIMATE CHANGE AND REDUCE THE NEED FOR MIGRATION.

FIGURE 4.10

OFF-FARM AGRIFOOD SYSTEMS ARE MORE IMPORTANT FOR YOUTH IN URBAN AREAS IN LESS CONSOLIDATED AGRIFOOD SYSTEMS

Share of employment in agrifood systems, by gender, age cohort and location (2021)



Note: Graph based on data from 47 countries: *Protracted crisis*: Ethiopia, Mali, Sudan, Zimbabwe. *Traditional*: Burkina Faso, Cambodia, Guinea-Bissau, India, Lao People's Democratic Republic, Madagascar, Nigeria, Pakistan, Rwanda, Senegal, Timor-Leste, Togo, Uganda, Zambia. *Expanding*: Bolivia (Plurinational State of), Egypt, El Salvador, Gambia, Georgia, Guatemala, Honduras, Iraq, Peru, Thailand, Viet Nam. *Diversifying*: Bosnia and Herzegovina, Ecuador, Mexico, Panama, Tunisia, South Africa. *Formalizing*: Belarus, Costa Rica, Dominican Republic, Jordan, Mongolia. *Industrial*: Australia, Austria, Czechia, France, Greece, Switzerland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

Youth participation varies among the various sectors that make up off-farm agrifood systems, ranging from 10.2 percent in transportation to 17 percent in food processing and services (Table 4.1). These shares increase for young adults aged 25–34, reaching approximately 25 percent across all categories, and surpassing 50 percent for older adults. There are also significant gender gaps in off-farm agrifood employment. Among male and female youth these gender gaps are most pronounced in trade and transportation – two of the more lucrative off-farm activities in agrifood systems,[32] where young women represent 4.8 percent and 0.7 percent of all workers, respectively, compared to 9.9 percent and 9.5 percent of young men. Across all age cohorts, men consistently have higher participation rates than women, and young women's share is always lower than their young adult and adult counterparts. Reduced participation of young women may be due to stricter social norms[55] and reduced access to capital and resources for this specific group[56] – essential factors for jobs that may require higher mobility and interactions with outsiders.[32]

> **"FEW YOUNG WOMEN ARE ENGAGED IN PROFITABLE OFF-FARM ACTIVITIES.**

TABLE 4.1 YOUTH ARE A SMALLER PORTION OF WORKERS ACROSS AGRIFOOD SYSTEMS SUB-SECTORS

YOUTH AS A SHARE OF OFF-FARM AGRIFOOD SYSTEMS SUB-SECTOR WORKERS, 2021 (IN %)

CATEGORIES	YOUTH, 15–24		YOUNG ADULTS, 25–34		OLDER ADULTS 35+	
	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN
FOOD PROCESSING AND SERVICES	6.6	10.4	8.9	15.7	25.4	31.8
MANUFACTURE OF NON-FOOD AGRICULTURAL PRODUCTS	5.9	9.7	9.8	15.6	23.9	34.5
TRADE	4.8	9.9	8.6	17.3	19.8	38.6
TRANSPORTATION	0.7	9.5	2.1	25.5	5.2	56.4

Notes: Based on data from 52 countries: *Protracted crisis*: Afghanistan, Ethiopia, Palestine, Zimbabwe. *Traditional*: Cambodia, Comoros, India, Pakistan, R wanda, Timor-Leste, Uganda, Z ambia. Expanding: Angola, Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Eswatini, Georgia, Iraq, Kyrgyzstan, Peru, Sri Lanka, Thailand, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, South Africa, Trinidad and Tobago. *Formalizing*: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Saudi Arabia, Slovakia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Czechia, Finland, Greece, Israel, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland. The list of ISIC codes in each category can be found in Table A2.1, **Appendix 2**.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

SPECIALIZATION AND DIVERSIFICATION

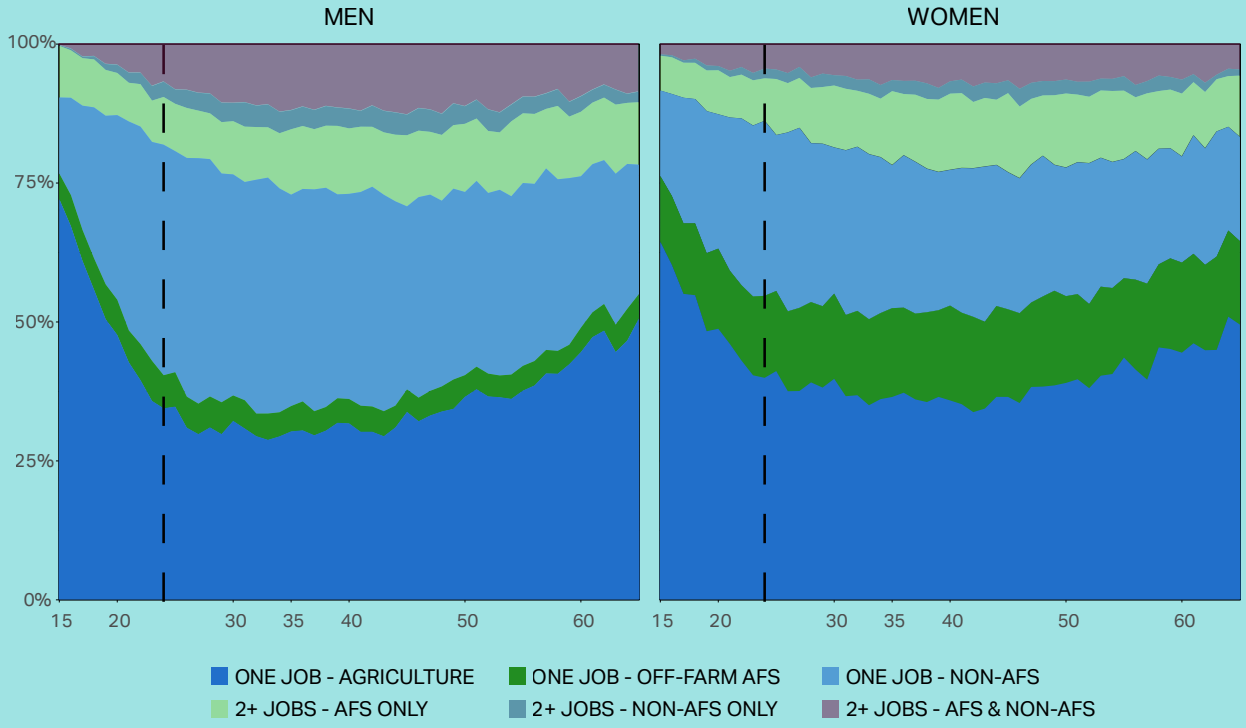
Diversification is a key feature of urban and rural livelihoods in low- and lower- and middle-income countries, with households holding diverse portfolios consisting of multiple income sources and activities across sectors and occupations.[57–61] Households diversify as a result of push and pull factors including market failure, risk management, better job opportunities and/or complementary activities.[57, 62–64] Such diversification can happen at the household level with different household members allocating their time to different activities,[58, 65] or at the individual level with one individual holding more than one job within or across sectors.[1, 33, 66–68]

Youth are less likely than adults to hold multiple jobs or diversify their portfolio of activities (Figure 4.11).[c] Across a sample of 16 low- and lower-middle-income countries, young men and women are more likely than their adult counterparts to hold one job only, in agriculture, in off-farm agrifood systems employment or outside agrifood systems. Even at the maximum level of diversification, at around age 50 for both men and women, only 25 percent of individuals have more than one job.

FIGURE 4.11

YOUTH ARE MORE LIKELY THAN ADULTS TO HAVE ONLY ONE JOB OR TO WORK IN THE SAME SECTOR

Share of individuals with one job or more, by gender, age and sector



Note: Data from 16 countries: Benin, Bolivia (Plurinational State of), Burkina Faso, Côte d'Ivoire, Georgia, Guatemala, Guinea Bissau, Mali, Mozambique, Niger, Nigeria, Peru, Senegal, Sierra Leone, Togo, Uganda). Unweighted means. More information on how the number of jobs were computed available in Davis *et al.*[1]

Source: Author's own elaboration, using data shared by Davis *et al.*[1] and building on data from the Rural Livelihoods Information System (RuLIS).[71] The list of surveys used for this graph is available in Appendix 3.

c In this analysis, the number of jobs is computed from information collected from employment modules in the questionnaires and does not account for time spent in own farming from the agriculture module. Diversification of activities may thus be underestimated, especially for individuals in rural areas, who are more likely to combine own farming with off-farm activities.[57, 61, 62]

Youth, and especially younger youth, rely more extensively on agrifood systems than adults, regardless of how many jobs they hold (Figure 4.11). Among individuals with only one job, larger shares of youth are engaged in agrifood systems, in particular in agriculture, than adults. In line with the results presented earlier in this chapter, larger shares of young women are engaged in off-farm agrifood systems employment and larger shares of young men in employment outside agrifood systems. Even when young people hold more than one job, all of them are likely to be in agriculture. The majority of youth having multiple jobs either work solely in agrifood systems (either in agriculture, off-farm agrifood systems or a combination thereof) or combine agrifood systems employment with work outside agrifood systems. In other words, most youth diversifying their portfolios and livelihoods incorporate agrifood systems into their activities.

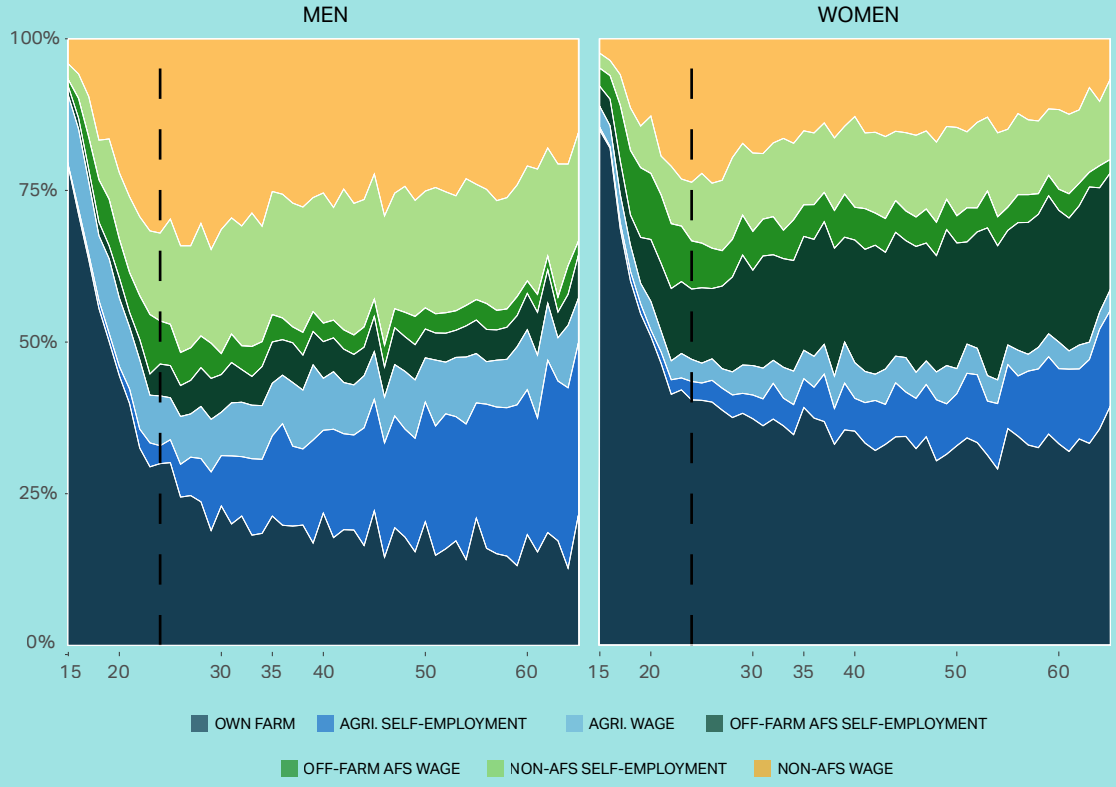
While youth increasingly seek occupations outside agriculture which they consider to reflect a higher social status and be better remunerated, agriculture remains an important element of their livelihoods. In India, for example, youth are rapidly exiting from agriculture yet lack the necessary skills to successfully transition out of farming profitably.[69] Conversely, in Ghana, the United Republic of Tanzania and Zimbabwe, three agricultural commercialization hotspots in Africa, youth are diversifying their income, but crop and/or livestock production remain a key livelihood strategy for many.[70]

©FAO/VEEJAY VILLAFRANCA
IN MAGALANG, PAMPANGA, PHILIPPINES, YOUNG AGRICULTURE PROFESSIONALS COLLABORATE WITH EXPERTS TO DEPLOY DRONES FOR ASSESSING RICE CROP DAMAGE, HIGHLIGHTING THE ROLE OF YOUTH IN ADVANCING AGRI-TECH SOLUTIONS FOR CLIMATE RESILIENCE.

FIGURE 4.12

YOUTH ALLOCATE LARGER SHARES OF THEIR TIME TO OWN AND HOUSEHOLD FARMING

Share of full-time equivalents allocated to different sectors and types of job, by age and gender



Notes: The dashed line indicate the age of 24. Pooled data from four countries from sub-Saharan Africa (Malawi, Nigeria, United Republic of Tanzania, Uganda) and one country from Latin America and the Caribbean (Peru). Unweighted means.

Source: Author's own elaboration, further processing data shared by Davis *et al.*[1] and building on data from the Rural Livelihoods Information System (RuLIS).[71] The list of surveys used for this graph is available in Appendix 3.

Beyond the number of jobs, youth are allocating more of their time to agrifood systems employment. Full-time equivalents (FTEs) provide a more detailed picture of engagement in labour markets, accounting for seasonality and the part-time nature of work.[34] In line with recent evidence,[34] an analysis of FTEs[d], pooling data from young and adult workers in four countries from sub-Saharan Africa (Malawi, Nigeria, the United Republic of Tanzania and Uganda) and one from Latin America and the Caribbean (Peru), shows that both male and female youth allocate larger shares of their FTEs to farming in their own or their household's farm, before allocating larger shares of their time to other types of work as they grow older (Figure 4.12). This finding is in line with the higher shares of adults employed outside agrifood systems reported earlier (Figure 4.9).

Different patterns between men and women are visible as they transition to (young) adulthood. While young men appear to transition more towards non-agrifood systems wage employment and self-employment, young women and adults allocate larger shares of their time to off-farm

d More details about how the full-time equivalents were computed are available in Appendix 3.

agrifood systems employment, mostly through self-employment. Overall, and across age cohorts, women are less likely than men to access wage employment, regardless of the sector.

INTERGENERATIONAL MOBILITY IN AND OUTSIDE AGRIFOOD SYSTEMS

As demonstrated above and in earlier chapters, exit from agriculture and agrifood systems is driven by processes of structural transformation and agrifood systems transition. These movements necessarily involve intergenerational mobility, where youth move to an employment sector offering higher returns than that of their parents.[18, 72, 73]

A study developed for this report using data from 27 surveys in 18 countries shows a positive correlation between agricultural productivity growth and intergenerational employment mobility, confirming that a vibrant agricultural and primary sector is correlated with more opportunities in other non-primary sectors (Figure 4.13, panels A and B). Countries with lower agricultural labour productivity growth, such as

> **YOUTH, ESPECIALLY YOUNGER YOUTH, ALLOCATE MORE TIME IN FARMING THAN OLDER COHORTS.**

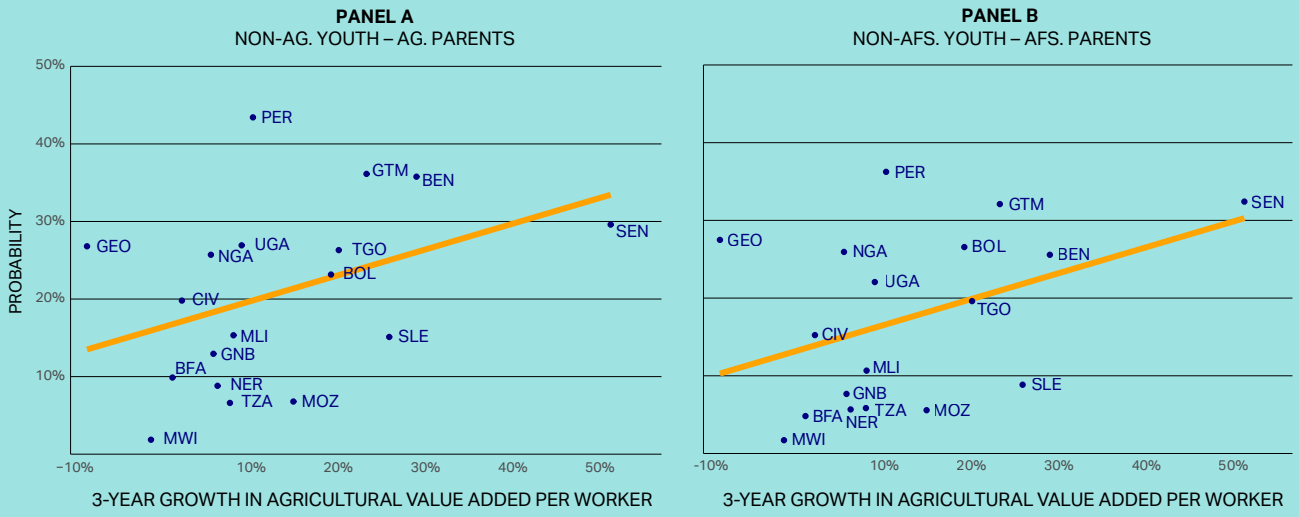
Malawi, Mali, Mozambique or the United Republic of Tanzania, exhibit lower youth intergenerational mobility probabilities outside of agriculture or agrifood systems. Conversely, youth in countries with higher agricultural labour productivity growth (e.g. the Plurinational State of Bolivia, Guatemala, Peru, Nigeria) are more likely to work outside of agriculture and agrifood systems, where their parents work. One of the more extreme cases is Malawi, where a stagnant primary sector provides few labour opportunities of employment outside the primary sector

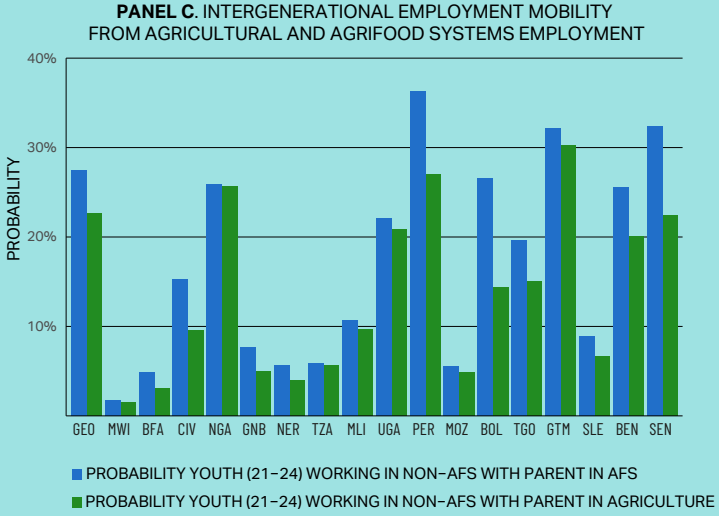
©IFAD/GIANCARLO SHIBAYAMA/ FACTSTORY IN CHAZUTA, PERU, 27-YEAR-OLD DAVID SANTOS HUANCAS, ONE OF THE YOUNGEST MEMBERS OF THE ALLIMA CACAO COOPERATIVE, LEADS PRODUCT TRACEABILITY AND DIGITAL MARKETING EFFORTS, SHOWCASING HOW YOUTH ARE USING AGRI-DIGITALIZATION TO BOOST RURAL BUSINESS, CREATE JOBS AND CONNECT SMALLHOLDER FARMERS TO NEW MARKETS.

FIGURE 4.13

PROBABILITY OF YOUTH ENGAGING IN A DIFFERENT SECTOR FROM THEIR PARENTS INCREASES AS COUNTRIES UNDERGO STRUCTURAL TRANSFORMATION

Share of full-time equivalents allocated to different sectors and types of job, by age and gender





Note: Data from 18 countries: Georgia, Malawi, Burkina Faso, Côte d'Ivoire, Nigeria, Guinea Bissau, Niger, United Republic of Tanzania, Mali, Uganda, Peru, Mozambique, Bolivia (Plurinational State of), Togo, Guatemala, Sierra Leone, Benin, Senegal.
Three letter abbreviations are ISO Alpha-3 codes. For a full list please see: https://unstats.un.org/unsd/methodology/m49/

Source: Author's own elaboration, further processing data shared by Davis *et al.*[1] and building on data from the Rural Livelihoods Information System (RuLIS).[71] The list of surveys used for this graph is available in Appendix 3.

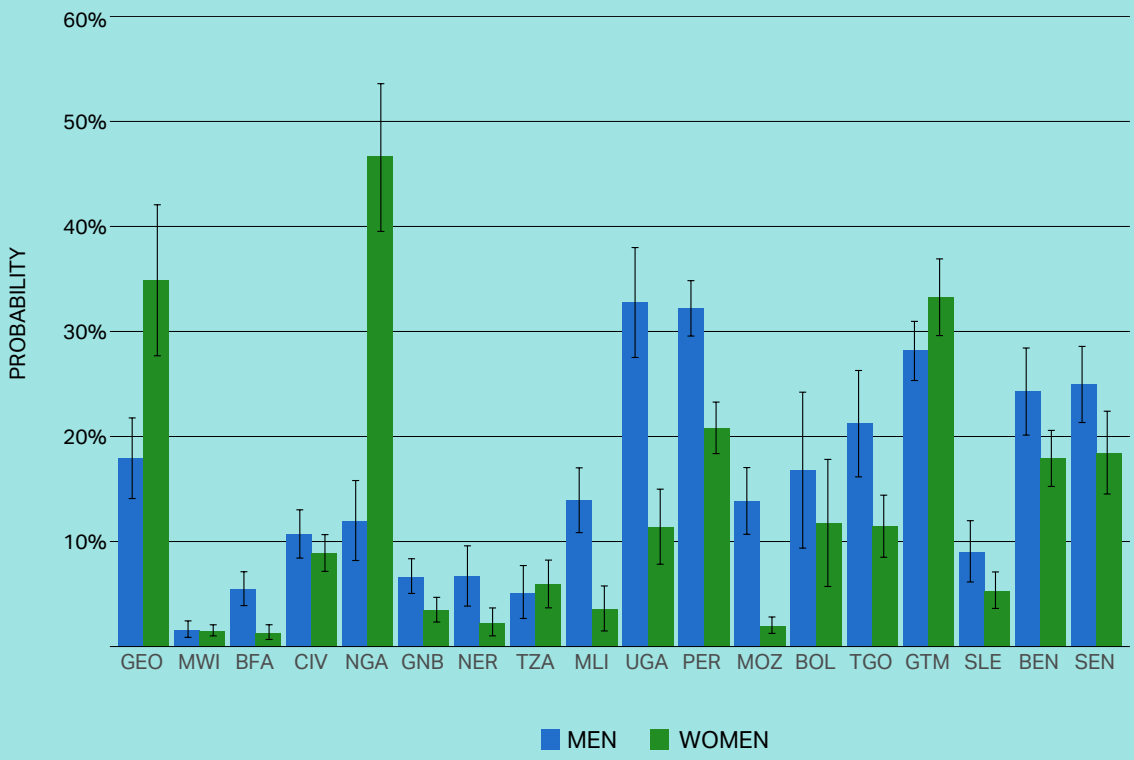
for younger generations. Meanwhile, Senegal, the sub-Saharan country in the sample with the highest growth in agricultural productivity, displays the highest share (among sub-Saharan countries) of younger employees working outside both agricultural and agrifood system employment, the sector of their parents.

Off-farm agrifood systems employment of a parent provides more opportunities for intergenerational mobility than agricultural employment. With the exception of Malawi, where intergenerational mobility is very low, the probability of the younger generation working outside agrifood systems employment is higher in all countries, when parents work in agrifood systems

FIGURE 4.14

YOUNG WOMEN ARE LESS LIKELY THAN YOUNG MEN TO EXPERIENCE INTERGENERATIONAL MOBILITY OUTSIDE AGRIFOOD SYSTEMS

Probability of youth with parents working in agrifood systems to work outside agrifood systems, by gender



Note: Data from 18 countries: Georgia, Malawi, Burkina Faso, Côte d'Ivoire, Nigeria, Guinea Bissau, Niger, United Republic of Tanzania, Mali, Uganda, Peru, Mozambique, Bolivia (Plurinational State of), Togo, Guatemala, Sierra Leone, Benin, Senegal.
Three letter abbreviations are ISO Alpha-3 codes. For a full list please see: https://unstats.un.org/unsd/methodology/m49

Source: Author's own elaboration, further processing data shared by Davis *et al.*[1] and building on data from the Rural Livelihoods Information System (RuLIS).[71] The list of surveys used for this graph is available in Appendix 3.

more broadly, than when parents work in agricultural employment exclusively (Figure 4.13, Panel C).

Yet, the possibilities for intergenerational sectoral mobility are not spread evenly across women and men (Figure 4.14). The probabilities of intergenerational mobility out of agrifood systems employment are significantly higher for males in 12 of the 18 countries considered, and larger for female youth in only 3 countries. These results indicate that social norms, particularly those assigning gender to different types of economic activities, may play an outsized role in determining intergenerational mobility and employment possibilities. They also have policy implications, as gender neutral employment policies for the young are not likely to be gender neutral in outcomes.

YOUTH ENGAGE IN MORE PRECARIOUS WORK IN AGRIFOOD SYSTEMS

Ensuring that youth access full and productive employment and decent work is essential to achieving SDG 8. Yet, working conditions in agrifood systems are usually more precarious than in other sectors, particularly for youth.[8,74,50] This section assesses the working conditions of young women and men in agrifood systems, examining their status of employment, the time they work in agrifood systems, and the inequalities in specific labour and welfare outcomes to which these precarious working conditions can lead.

VULNERABLE EMPLOYMENT

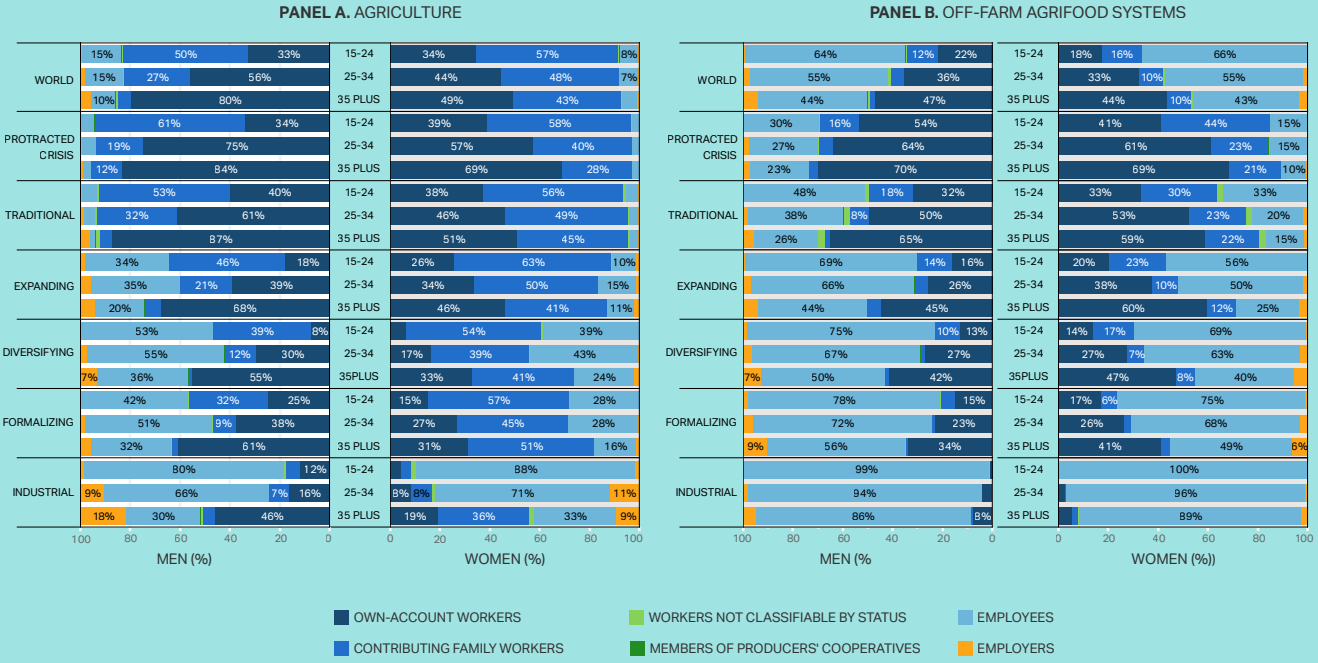
Globally, 91 percent of young women and 83 percent of young men working in agriculture are either own-account workers or contributing family workers, which are defined as forms of vulnerable employment.[75] Whether on family farms or in other activities, they often work in informal arrangements without pay, not benefiting from social protection and are more vulnerable to various risks.[32,76] As agrifood systems transition, the share of young workers in vulnerable employment decreases (Figure 4.15, Panel A). In protracted crisis and traditional agrifood systems, more than 90 percent of young workers are in vulnerable employment, with corresponding shares of 65 percent of young men and 89 percent of young women in expanding agrifood systems.

> **IN 2021, 91 PERCENT OF YOUNG WOMEN AND 83 PERCENT OF YOUNG MEN IN AGRICULTURE ARE IN VULNERABLE EMPLOYMENT.**

FIGURE 4.15

YOUTH IN AGRIFOOD SYSTEMS ARE LIKELY TO BE IN VULNERABLE FORMS OF EMPLOYMENT, ESPECIALLY IN LESS DEVELOPED AGRIFOOD SYSTEMS

Working status, by sector, gender and age cohorts (2021)



Notes: Graph based on data from 61 countries:
Panel A: *Protracted crisis*: Afghanistan, Ethiopia, Palestine, Zimbabwe. *Traditional*: Cambodia, Comoros, India, Pakistan, Rwanda, Timor-Leste, Uganda, Zambia. *Expanding*: Angola, Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Eswatini, Georgia, Iraq, Kyrgyzstan, Peru, Sri Lanka, Thailand, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, Trinidad and Tobago. *Formalizing*: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Saudi Arabia, Slovakia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Czechia, France, Greece, Israel, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.
Panel B: *Protracted crisis*: Afghanistan, Ethiopia, Occupied Palestinian Territory, Zimbabwe. *Traditional*: Cambodia, Comoros, India, Pakistan, Rwanda, Timor-Leste, Uganda, Zambia. Informal and expanding: Angola, Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Eswatini, Georgia, Iraq, Kyrgyzstan, Peru, Sri Lanka, Thailand, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, Trinidad and Tobago. Modernizing and formalizing: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Saudi Arabia, Slovakia, Türkiye, United Arab Emirates. *Industrial*: Australia, Austria, Czechia, France, Greece, Israel, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org/

In diversifying and formalizing agrifood systems, these shares decrease to about half of young men and 62 percent and 71 percent, respectively, of young women. In these systems, most young workers in agriculture are contributing family workers. The shares drop to less than 20 percent in the industrial category.

The shares of contributing family workers among young men and women in agriculture are similar in protracted crisis and traditional agrifood systems. These high levels could be linked to lack of alternative opportunities for youth, who eventually rely on their household's farms for their livelihoods, especially in less densely urbanized areas.[34] Gender differences are more visible in expanding, diversifying, and formalizing agrifood systems. In these categories, the share of young men in vulnerable employment in agriculture decreases, as more young men are wage employees. The share of young female contributing family workers also decreases as agrifood systems transition and consolidate, but more slowly. Countries with lower fertility rates and more gender egalitarian laws concerning marriage, parenthood, and access to social protection and resources tend to have smaller gender gaps in vulnerable employment.[77] Despite these improvements, a large portion of the remaining gender gaps can be attributed to gender norms and institutional frameworks that constrain women's roles and access to decent employment.[77, 78]

Globally, larger shares (approximately two-thirds) of both men and women in off-farm agrifood systems are employees (Figure 4.15, Panel B). The share of youth working as employees in off-farm agrifood systems increases as systems transition, from 30 percent of young men and 15 percent of young women in protracted crisis systems to practically all young men and women in industrial systems. Across all agrifood system categories, older workers, both men and women, account for higher shares of vulnerable employment than their younger counterparts. This shift to employees as agrifood systems transition reflects labour trends occurring with structural transformation, first from own-account workers in agriculture to own-account workers outside agriculture, before moving progressively from the latter to employees.

These trends reflect the modernization of agrifood systems and the growth of high-value chains, which has led to the generation of wage employment opportunities in rural areas, and benefited young rural women.[52, 79, 80] Such jobs are typically found in agro-processing facilities and food services.[52, 81] However, though the share of vulnerable employment reduces for both young men and women across agrifood systems, a consistently greater share of young women than young men are in vulnerable employment, particularly as contributing family workers (Figure 4.15). Similarly, young women in off-farm agrifood systems are more likely to be working for someone else, potentially limiting their control of income generated.[34] Yet, no significant gender wage gaps are found among youth working in wage employment in agrifood systems (Box 4.2).

FULL-TIME EMPLOYMENT AND UNPAID CARE WORK

Employment in both agricultural and non-agricultural food systems is highly seasonal, driven by the nature of the agricultural calendar.[82, 83] Both on- and off-farm work in agrifood systems tend to be highly seasonal,[45] affecting particularly youth aged 15–19 and 20–24, who across all agrifood systems work fewer hours on average than their adult counterparts (Figure 4.16). Many youth do not necessarily aspire to work as full-time farmers;[17, 84, 85] indeed, youth from the youngest cohorts and those attending school tend to view agriculture more as a secondary or transitional activity than a long-term career.[15, 18, 35, 17, 84, 85]

BOX 4.2 GENDER PAY GAPS AMONG YOUTH

In addition to inequalities in working conditions and access to assets (Chapter 3), youth face persistent inequalities in economic outcomes, such as pay and economic returns. Pay gaps between men and women remain widespread, particularly in low- and lower-middle income countries.[i, ii] Recent evidence shows that women's wages in agriculture and non-farm employment in rural areas are significantly lower than those of their male counterparts.[iii–vii,viii, ix]

An analysis conducted for this report found that women aged 15–24 working in agrifood systems do not appear to be paid significantly less than their male counterparts, while those outside agrifood systems were paid 11 percent less (Table 1). The gender gaps in wages are higher for adults aged 25–34, driven primarily by "endowment effects", or the difference in characteristics such as education, skills and equality of labour market access. This underscores the critical role that equal access to decent employment opportunities can play in reducing gender-based wage disparities, which is consistent with recent evidence showing that in areas where women have better access to full-time employment and education, the wage gap tends to narrow.[iv, viii]

TABLE A GENDER WAGE GAPS IN AND OUTSIDE AGRIFOOD SYSTEMS, BY AGE COHORT (KITAGAWA-OAXACA-BLINDER[x, xi, xii])

YOUTH AS A SHARE OF OFF-FARM AGRIFOOD SYSTEMS SUB-SECTOR WORKERS, 2021

	AFS			NON AFS		
	15–24	25–34	35+	15–24	25–34	35+
GAP	0.02	0.13	0.16	0.11	0.03	0.10
ENDOWMENT EFFECTS	–0.10	0.16	0.10	–0.01	0.07	0.17
STRUCTURAL EFFECTS	0.12	–0.02	0.06	0.12	–0.04	–0.07

Notes: The analysis used a pooled sample from 14 countries, including 9 traditional agrifood systems (Bangladesh, Cambodia, Côte d'Ivoire, Ghana, Malawi, Pakistan, Senegal, Uganda, United Republic of Tanzania), 4 expanding agrifood systems (Egypt, Guatemala, Iraq and Viet Nam) and one diversifying agrifood systems (Ecuador). Wage gaps are expressed in log hourly wages in real international USD. The Kitagawa-Oaxaca-Blinder Decomposition model controls for education, proxied by whether an individual completed primary education; job characteristics, including whether the worker has a written contract, receives any fringe benefits, works full-time, has multiple jobs and whether this a low-skill job; the sector of occupation; and labour market characteristics, proxied by average agricultural and non-agricultural employment shares for different demographic groups and country fixed effects.

Source: Author's own elaboration, using data processed by Benali *et al.*[iv]

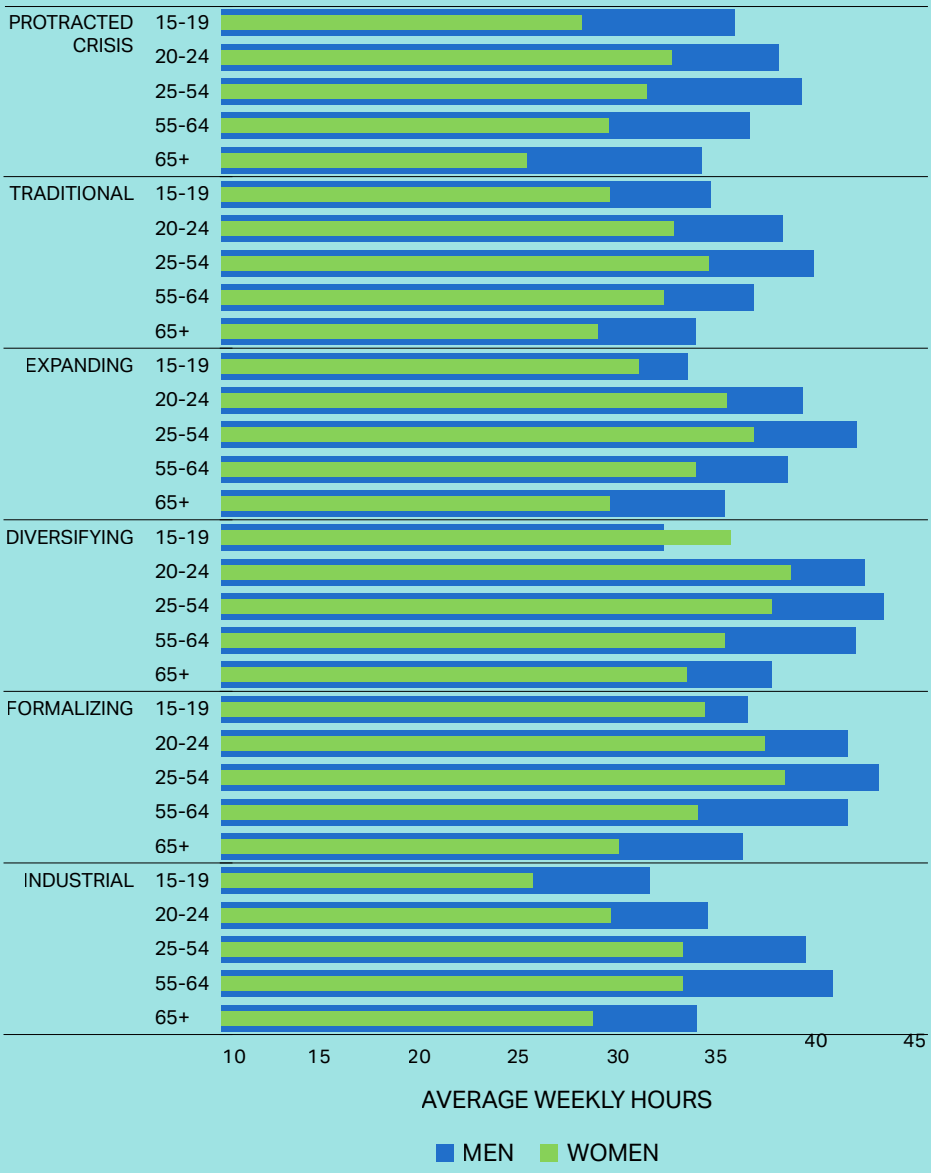
The lack of gender wage gaps in agriculture and agrifood systems among the youngest category could be linked to the fact that youth, both men and women, engage primarily in low-skilled and low-pay wage employment in large farm holdings or off-farm activities,[xiii] where shadow wages, representing the opportunity cost of labour, remain low and limited prospects for productivity growth constrain the potential for increases in wages, regardless of gender.

Notes: Refer to the **Notes section** for full citations.

FIGURE 4.16

YOUTH, ESPECIALLY YOUNG WOMEN, ARE LESS LIKELY TO WORK FULL TIME

Mean weekly hours actually worked per employed person in agrifood systems (main job), by gender and age cohort (2021)



Note: Graph based on data from 47 countries: *Protracted crisis*: Afghanistan, Ethiopia, Palestine, Zimbabwe. *Traditional*: Cambodia, Comoros, India, Pakistan, Rwanda, Timor-Leste, Uganda, Zambia. *Expanding*: Angola, Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Eswatini, Iraq, Kyrgyzstan, Peru, Sri Lanka, Thailand, Viet Nam. *Diversifying*: Bosnia and Herzegovina, Iran (Islamic Republic of), Mauritius, Mexico. *Formalizing*: Albania, Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Slovakia, Türkiye. *Industrial*: Austria, Czechia, France, Greece, Israel, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

Women disproportionately experience underemployment and are less likely than men to work full time in agrifood systems.[32] Men on average work longer hours in agrifood systems than women (with the exception of the 15–19 age cohort in emerging and diversified systems) (Figure 4.16). However, women usually combine home chores with farm work[25, 86, 87] and have a time burden up to four times higher than men.[32]

Women's greater time burden derives from time allocated to unpaid domestic and care work,[32] which constrains them from allocating more time to economic and remunerative activities[88] and lowers both their participation and time spent in the labour market.[32, 89] Women spend more time in unpaid care work across agrifood systems and age cohorts (Figure 4.17).[90] Across all countries, women aged 15–24 allocate 2.9 times more time than men to unpaid and domestic work, with similar inequalities found for adults aged 25–44 and 45–54. At the country level, the amount of time women spend on domestic and unpaid work ranges from five times greater than men in Kenya, Guatemala and Palestine, to close to one in Finland and Sweden, where men and women spend the same or similar amount of time on domestic and unpaid care work. In five countries, inequalities between young men and young women are smaller than in older cohorts. In a few countries, though, such as the Dominican Republic, Georgia and Guatemala, young women aged 15–24 spend more time on unpaid and care work than their male counterparts, compared to older cohorts.

> **YOUTH WORKING IN AGRIFOOD SYSTEMS, ESPECIALLY YOUNG WOMEN, ARE LESS LIKELY TO WORK FULL TIME THAN ADULTS.**

©IFAD/FERNANDA DORADO
IIN TLAOLA, MEXICO, YOUNG ENTREPRENEUR JOSÉ ALFREDO REVIVES THE NEARLY LOST TRADITION OF *QUESADILLA FINA*, USING HIS BAKERY AND DIGITAL TOOLS TO CELEBRATE INDIGENOUS CULINARY HERITAGE, EMPOWER YOUTH AND STRENGTHEN COMMUNITY IDENTITY.

FIGURE 4.17

ACROSS ALL AGE COHORTS, WOMEN ALLOCATE MORE TIME TO UNPAID AND CARE WORK

Female-to-male ratio of average time spent on unpaid domestic and care work within a 24-hour period

Note: Three letter abbreviations are ISO Alpha-3 codes. For a full list please see: https://unstats.un.org/unsd/methodology/m49

Source: Author's own elaboration using data from the United Nations Department of Economic and Social Affairs (UNDESA). 2024. Unpaid work. In: UNDESA. New York, USA. [Cited 1 January 2025].

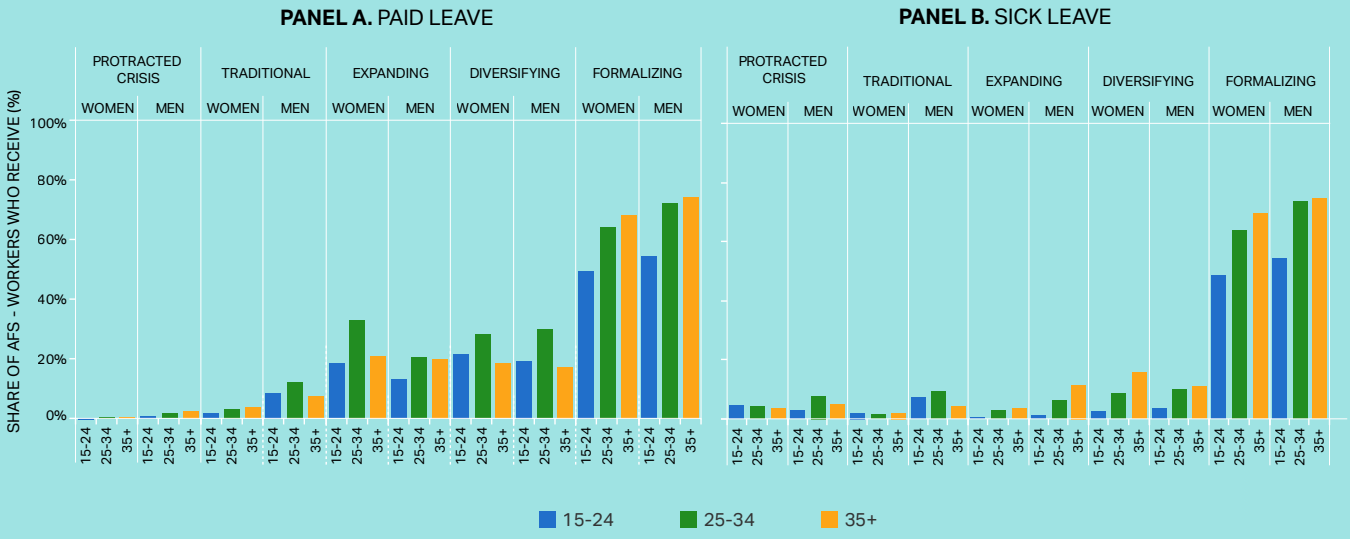
BOX 4.3 GAPS IN WORK-RELATED SOCIAL INSURANCE AND BENEFITS

Beyond wages and income, the decent work framework of the International Labour Organization (ILO) includes other forms of compensation for earnings such as paid leave, which includes paid annual and sick leave.[i] These types of leave, as part of broader social coverage schemes, can help stabilize incomes.[ii] However, they are often tied to formal jobs and are not common in sectors where informality is the norm, such as agrifood systems. Informality is a common feature of rural labour markets in low- and lower-middle-income countries, where rural youth mostly engage in informal activities.[iii] For these reasons, youth engaged in agrifood systems are expected to have lower social insurance coverage and benefit to a lesser extent from these types of benefits.

Data from the ILO enables assessment of the extent to which young women and men in agrifood systems employment benefit from paid and sick leave (Figure A). Overall, across all types of agrifood systems, youth aged 15–24 are less likely than adults to receive paid (Figure A, Panel A) or sick (Figure A, Panel B) leave. Differences between youth and adults are starker in formalizing agrifood system, while overall coverage increases as agrifood systems transition. Across all types of agrifood systems, young adults have greater access to these benefits than youth and other adults. The differences between age cohorts in terms of coverage seem to disappear in countries with more developed types of agrifood systems, in which older adults and young adults may have a similar propensity to access quality jobs.

FIGURE A

YOUTH OVERALL RECEIVE FEWER BENEFITS THAN ADULTS



Notes: Data from 82 countries:
Panel A: *Protracted crisis*: Afghanistan, Burundi, Mali, Palestine, Sudan, Zimbabwe. *Traditional*: Bangladesh, Benin, Burkina Faso, Comoros, Guinea-Bissau, India, Lao People's Democratic Republic, Madagascar, Myanmar, Nigeria, Pakistan, Rwanda, Senegal, Timor-Leste, Togo, Uganda, United Republic of Tanzania, Zambia. *Expanding*: Angola, Bolivia (Plurinational State of), Botswana, Egypt, Eswatini, Gambia, Georgia, Guatemala, Iraq, Kyrgyzstan, Samoa, Sri Lanka, Viet Nam. *Diversifying*: Bosnia and Herzegovina, Ecuador, Mexico. Modernizing and formalizing: Albania, Argentina, Costa Rica, Dominican Republic, Jordan, Mongolia, United Arab Emirates.
Panel B: *Protracted crisis*: Afghanistan, Burundi, Mali, Palestine, Sudan, Zimbabwe. *Traditional*: Bangladesh, Benin, Burkina Faso, Comoros, Guinea-Bissau, Lao People's Democratic Republic, Madagascar, Myanmar, Nigeria, Pakistan, Rwanda, Senegal, Timor-Leste, Togo, Uganda, United Republic of Tanzania, Zambia. *Expanding*: Angola, Botswana, Egypt, Eswatini, Gambia, Georgia, Iraq, Kyrgyzstan, Samoa. *Diversifying*: Bosnia and Herzegovina, Ecuador. *Formalizing*: Albania, Argentina, Costa Rica, Dominican Republic, Jordan, Mongolia, United Arab Emirates. The graphs do not include information from countries with industrial agrifood systems as the number of countries from this group was too low.

Source: Own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

Notes: Refer to the **Notes section** for full citations.

SPOTLIGHT 4.1 IN LOW- AND LOWER-MIDDLE-INCOME COUNTRIES, YOUTH ENGAGEMENT IN AGRIFOOD SYSTEMS DEPENDS ON THE SPACES IN WHICH THEY LIVE

Structural transformation is characterized by urbanization and changing rural-urban linkages.[i, ii] These linkages yield a diversity of spaces in terms of distance to urban centres and densely populated areas, as well as access to activities and services.[iii–v] The diversity of these spaces translates into an array of economic opportunities and livelihoods as well as challenges for youth and adults.[iv, vi–ix]

Recent evidence shows that youth engagement in specific employment is shaped by the opportunities available in the spaces in which they live.[vi, vii, x] Analysis developed for this spotlight builds on this existing spatial framework presented in Chapter 2 with information on access to markets (proxied by travel time to different types of spaces) and digital connectivity (proxied by access to different type of mobile networks), building a new and more disaggregated categorization of spaces ranging from severe challenges to high opportunities (adapting the framework presented in Chapter 2).

The results confirm that youth engagement in agrifood systems depends heavily on spatial contexts (Figure A, Panel A). Across a sample of 18 low- and lower-middle income countries, agrifood systems employment remains important across all types of spaces, but is more significant in spaces characterized by low connectivity – either those with low land productivity (severe challenges spaces) or those with higher land productivity, yielding more agricultural opportunities.

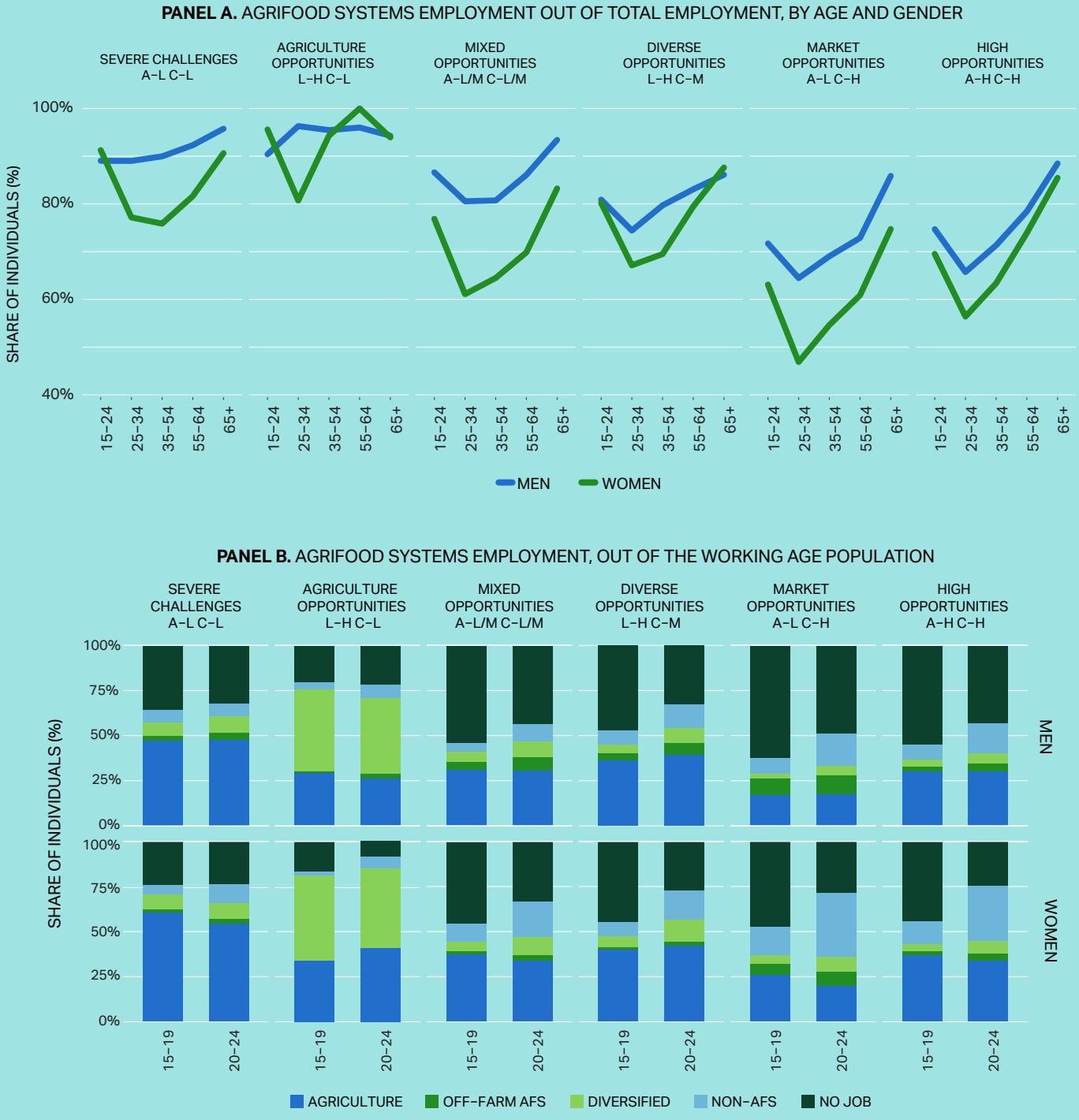
Across all spaces, agrifood systems remain a key entry point for youth, as noted earlier in this chapter. However, the nature and patterns of engagement in agrifood systems vary significantly between the different type of spaces. In spaces characterized by severe challenges or agriculture opportunities, young female adults remain and work more than male youth, while young male adults exit agrifood systems, as shown in Figure 4.3. In spaces characterized by low connectivity, and thus potentially lower mobility, young women may not be able to access livelihood opportunities outside agriculture. Women's limited mobility,[xi, xii] combined with their domestic and child care responsibilities,[xiii] can thus further limit their engagement in off-farm (agrifood systems) employment in less connected spaces. In spaces with higher degrees of connectivity, young women may be more able to access off-farm opportunities located outside or further from the household's location.

While agriculture remains key for youth livelihoods in low or medium opportunity spaces, off-farm agrifood systems are more important for youth in mixed, diverse and market opportunities spaces, especially women. As connectivity increases, larger shares of women engage and take advantage of off-farm agrifood systems opportunities generated by greater proximity or easier access to urban areas and consumer demand.[ii] This dynamic is most apparent in spaces with market opportunities, where higher levels of off-farm agrifood systems employment are observed. In these contexts, off-farm employment may form part of a livelihood diversification strategy, to potentially offset the reduced income from agriculture resulting from lower land productivity. Yet, in the diverse opportunities settings, where land productivity is higher, women aged 25–34 engage less in agriculture and more in off-farm agrifood systems, which could be indicate that women from this group eventually tend to exit agriculture when opportunities outside the sector are available – a pattern possibly driven by increases in agricultural productivity.

Even when all working-age youth are taken into consideration, not just those in employment, agrifood systems employment remains critical for young people (Figure A, Panel B). Agriculture remains key in spaces constrained by severe challenges, while larger shares of working-age youth diversify their activities in low connectivity spaces with higher agriculture opportunities, either within agrifood systems, combining and agricultural and off-farm agrifood systems employment, or outside agrifood systems combining agrifood system employment with work. In high connectivity spaces, while slightly less or about half of youth still rely on agriculture, larger shares of youth have no job, potentially exiting the labour force to either pursue education – understanding that educational attainment is higher in urban areas (see Chapter 3) – or being unemployed, taking into consideration the typically higher unemployment and NEET rates among urban youth.[xiv] Specialization in non-agrifood systems employment increases in spaces with medium to high connectivity, with a stronger rise among youth aged 20–24, reflecting the importance of non-agrifood systems employment in spaces in or closer to peri-urban and urban areas.[i, xv]

©FAO/A.K. KIMOTO IN SIEM REAP, CAMBODIA, LAND SINOUN PROUDLY SHOWS VISITORS HER THRIVING HOME GARDEN, DEMONSTRATING HOW SMALL-SCALE AGRICULTURAL SUPPORT CAN EMPOWER RURAL WOMEN AND FOSTER COMMUNITY RESILIENCE.

FIGURE A. AGRIFOOD SYSTEM EMPLOYMENT IS MORE IMPORTANT IN LESS CONNECTED SPACES



Notes: A/L: Low agricultural potential, C-L: Low connectivity, A/M: Medium agricultural potential, M-L: Medium connectivity, H/L: High agricultural potential, C-H: High connectivity.Data from 18 countries (Benin, Côte d'Ivoire, Burkina Faso, Guinea Bissau, Togo, Senegal, Niger, Bolivia (Plurinational State of), Guatemala, Mozambique, United Republic of Tanzania, Uganda, Georgia, Mali, Malawi, Nigeria, Peru, Sierra Leone).

Source: Own elaboration, further processing data shared by Davis *et al.*[xvi] and building on data from the Rural Livelihoods Information System (RuLIS).[xvii]

Notes: Refer to the **Notes section** for full citations.

SPOTLIGHT 4.2 CHILD LABOUR AMONG THE 15–17 COHORT

Little attention has been paid to youth aged 15–17, who belong to both the children (0–17) and youth age groups.[i] This cohort is characterized by specific biological, developmental and legal characteristics that distinguish them from older youth and adults. Biologically, youth aged 15–17 are in the later part of adolescence, a crucial stage of physical and cognitive development, characterized by biological growth and social transitions.[ii,iii] Individuals from this group have reached legal working age (set at 14 years old in some countries, and 15 or 16 years old in most countries) and can be in employment.[i,iv,v] They often face conflicting expectations and frequently engage in work that may be inappropriate for their age or development while lacking corresponding rights, voice or access to resources, which places them at heightened risk of involvement in child labour, particularly its worst forms.[iv] According to ILO Conventions Nos. 138 and 182, if they are involved in hazardous work, these youth are considered to be in a situation of child labour,[v,vi] which can have long-term negative implications for employment and health outcomes.[i,vii]

Thirty-five million youth aged 15–17, representing 9.5 percent of this cohort, are in a situation of child labour and hazardous work.[viii] Agriculture is more prone to hazardous work[ix] and employs 47.6 percent of all youth aged 15–17 in hazardous work.[viii] Children face a wide array of hazards and risks in the sector, including exposure to chemicals and extreme weather and temperatures, handling of dangerous tools and machinery, strenuous physical work, with heavy loads and repeated movements, or working with certain animals.[i, viii] The prevalence of child labour and hazardous work among youth aged 15–17 occurs more often in low- and lower-middle-income countries,[viii] where youth below the age of 18 generally work as contributing family workers in agriculture.[iv, viii]

Youth in child labour[vii] and hazardous work[viii] are less likely to be attending school or completing graduation. Besides the inherent health and physical and cognitive development risks associated with hazardous work, lower school attendance can eventually compromise children and youth's potential to build required professional skills and hamper future employment outcomes.[vii] The toll taken on youth's health and education can reduce their skills and productivity, further affecting their livelihoods and hampering the capacity of agrifood systems to ensure sustainable future food production.[iv]

Youth aged 15–17 face multiple challenges which heighten their vulnerability to hazardous forms of work and constrain their capacity to safely engage with agrifood systems. Compared to older youth (18–24), this cohort lacks the financial autonomy and legal capacity to own or access assets required for productive engagement in agrifood systems (see Chapter 3). For instance, evidence shows that they are less likely to own or access land, non-land and political assets than older youth.[x] Combined with their limited education, the lack of alternative productive and decent employment opportunities in rural areas often constrain youth aged 15–17 to work in subsistence agriculture or take up poor quality and low-paid jobs in off-farm segments of agrifood systems.[iv] Enforcement of child labour laws is also particularly challenging,[vii, viii] even more so in remote areas.[i] Data on the activities youth perform in agriculture and the related conditions are scarce, limiting the capacity to monitor and identify situations of child labour and hazardous work for this cohort.

Different patterns emerge as to girls' and boys' vulnerability to child labour and hazardous work in agriculture and broader agrifood systems. Child labour and hazardous work is more prevalent among boys than girls within the 15–17 age cohort (12.2 percent against

6.6 percent, respectively).[vii] They typically engage in different activities. Boys tend to be more involved in hazardous agricultural work, including heavier work in the field and work with livestock, while girls tend to engage in activities that are closer to the family home, including postharvest activities involving smaller livestock and the marketing of agricultural products.[iv]

Girls are also more likely to be engaged in household chores in their own homes.[xi–xiv] These "invisible" tasks are not always included in the definition of child labour but increase their overall work burden.[viii] Cultural norms in many regions constrain girls' mobility and limit their access to education, thereby reducing their opportunities for formal agricultural training and decent employment. Adolescent girls and young women, in particular, often face compounded barriers, including heightened risks of physical and emotional violence, discrimination and harassment, which further marginalize their participation in the agrifood sector.[xv]

Promoting safe work in agrifood systems for youth aged 15–17

Agrifood system employment remains critical for youth aged 15–17, especially in countries at the earlier stages of agrifood systems transition. Ensuring that youth aged 15–17 can access legal, non-hazardous work is thus critical, including for the sustainability of agrifood systems.[iv]

Protection of youth aged 15–17 from hazardous work in agrifood systems can be achieved through multiple approaches, targeting individual workers, their households and broader rural areas. First, young workers in agrifood systems should be protected from hazardous working conditions. For instance, promoting sustainable agricultural practices and labour-saving technologies can help reduce youth's exposure to agrochemicals and dangerous equipment.[i, iv] Non-state actors-based monitoring systems can also help identify situations of child labour in more remote areas and the informal economy.[viii] Second, targeted efforts should aim at reducing youth's likelihood to engage in hazardous work. Supporting their education and sector-specific skills training can help youth access decent and more productive jobs.[iv] In the same vein, interventions supporting rural and agricultural households can help reduce their likelihood to resort to child labour. Evidence shows that interventions combining livelihood and education support, such as in Peru,[xvi] or food-for-education programmes, such as in Burkina Faso,[xvii] can help reduce child labour in agricultural households. Third, broader investments and rural development policies (including in basic infrastructure, health and education) that aim to generate decent, quality and remunerative work opportunities are also essential. Besides offering decent alternatives to hazardous work to youth aged 15–17, both in and outside agrifood systems, prospects of better-quality jobs will encourage families to prioritize long-term youth education and training over child labour generated income.[iv]

Notes: Refer to the **Notes section** for full citations.

SPOTLIGHT 4.3 INDIGENOUS YOUTH'S WORK AND ACCESS TO ASSETS AND RESOURCES IN AGRIFOOD SYSTEMS

Forty-five percent of the world's estimated 476 million Indigenous Peoples are between 15 and 30 years of age.[i] While Indigenous Peoples constitute approximately 6.2 percent of the global population, with the majority living in middle-income countries, some sources place them among the most economically poor, representing more than 19 percent of the extreme poor.[i] It is important to note that for many Indigenous Peoples around the world, across the seven sociocultural regions, their ways of life are intricately connected to food and knowledge systems embedded within the diverse ecosystems of their territories and homelands, and not necessarily measured by economics and labour. For Indigenous Peoples, including Indigenous Youth, food is more than just eating – food carries nutritional, medicinal, healing, spiritual, social, cultural, relational and emotional dimensions and values.[ii] From an economics perspective, many Indigenous Peoples are dependent on agrifood systems for their livelihoods: the ILO estimates that 55 percent of Indigenous Peoples work in agriculture (compared to 27 percent in the non-Indigenous population). There is little to no disaggregated data available for Indigenous Youth by occupation.[iii]

Despite this lack of data, there is an increasing emphasis on documenting the important role that Indigenous Youth play in protecting and advocating for Indigenous Peoples' food and knowledge systems, the conservation of biodiversity, climate change adaptation, ecological restoration and food systems transformation in their communities. Indigenous Youth also actively participate in global forums including the Convention on Biological Diversity (CBD), the UN Convention to Combat Desertification (UNCCD), the UN Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP) and the UN Global Indigenous Youth Forum (UNGIYF). As with food, Indigenous Peoples and Indigenous Youth protect and prioritize biodiversity for its importance not just for their livelihoods but also for cultural, spiritual and symbolic reasons.[iv]

Additionally, interest is growing in better measuring and assessing the extent to which Indigenous Peoples, including Indigenous Youth, work in "traditional occupations", many of which are related to agrifood systems, such as hunting, gathering (including plants for both food and medicine), herding, fishing and aquaculture, pastoralism, cultivation, farming, beekeeping, forestry, the production of handicrafts (e.g. weaving, basketry, pottery, carving), and the preparation and storage of foods.[v] Such "traditional occupations" are intrinsically connected to the characteristics and collective stewardship required to sustain their food systems and territorial management. According to FAO's White/Wiphala Paper on Indigenous Peoples' food systems,[ii] "Indigenous Peoples' food systems consist of both food generation and food production, and different Indigenous Peoples' communities may participate in food generative and productive activities to differing extents".[ii]

Within these traditional occupations in agrifood systems, young Indigenous Peoples also play important roles in innovating, changing and adapting practices. For example, in Thailand, Indigenous Youth combined work with traditional agricultural practices with an innovative business model to create a community-based social enterprise.[vi] In the Philippines, youth members of the Lake Sebu Indigenous Women and Farmers Association advanced a project to make and sell banana chips during the COVID-19 pandemic to prevent food loss and waste due to interrupted supply chains. The bananas used were native species, which had greater resilience to

climate change. This project increased and diversified income for youth and their families, while incorporating sustainable practices and promoting biodiversity.[vii]

Many Indigenous Youth around the world are under increasing pressure to relocate to urban centres for reasons including economic opportunities or displacement. In spite of this, many Indigenous Youth are finding ways to remain connected with their cultures and food systems. For example, Indigenous Youth from the Anishnaabeg community in Canada demonstrated that rather than representing a loss of cultural traditions, their rural–urban mobility for work and education has helped finance traditional activities such as hunting, trapping, fishing and plant collection[viii] Additional examples from Northern America reveal Indigenous Youth sustaining and revitalizing their food and knowledge systems in both rural and urban areas, while protecting ecosystems through the cultivation and use of native species in culinary and production businesses, ranching, wild harvesting, fishing and hunting.[ix, x, xi] In Alaska, Indigenous Youth are collaborating with remote Native villages, planting food and native species to stabilize melting permafrost, and increase local food production and access to affordable, nutritious food.[xii]

In consultations held during the 2023 UN Global Indigenous Youth Forum and at World Food Forums since 2021, more than 200 Indigenous Youth leaders from across the seven sociocultural regions have shared initiatives they are leading to support Indigenous Peoples' food and knowledge systems.[xiii] Indigenous Youth from across Central and South America and the Caribbean are working to preserve and protect varieties of seeds and plant genetic resources through cultivation based on the milpa system. In the Amazon basin of Ecuador, Indigenous Youth are creating their own alternative economies founded on the plants, foods and medicines of their region. In Mexico, Indigenous Youth and Women face encroachment on their agricultural and grazing lands from wind projects and are advocating for Free, Prior and Informed Consent (FPIC) in relation to green energy projects.[xiv]

Indigenous Youth of the Ogiek People in Kenya and the Hunter-Gatherer Peoples in the Congo Basin are advocating to retain access to their homelands and sustain their traditional systems of forestry. Indigenous Youth in Botswana, Namibia and the United Republic of Tanzania are combating desertification and drought by applying new pastoralism approaches, restoring grasslands and planting small gardens for mobile schools.[xv, xvi] Indigenous Youth of the Kal Tamashek in Burkina Faso are identifying ways to sustain their nomadic livelihoods with livestock and wild harvests in the face of desertification and political violence.[xvii]

Saami Youth across Scandinavia are actively engaged in protecting grazing lands for their reindeer herds and are finding ways to sustain their mobile livelihoods despite encroachment and climate change impacts[xviii] Indigenous Youth in the Arctic regions of Alaska, the United States of America and Nunavut, Canada are studying arctic marine life with the aim of sustaining traditional hunting, whaling and fishing practices in sustainable ways.[xix]

Indigenous Youth in Arctic regions of the Russian Federation are also working to maintain their food systems, which are rooted in hunting, fishing and reindeer herding, despite territorial challenges and climate change.[xx] In the North Caucasus, Indigenous Youth are collaborating with Indigenous chefs and food historians to learn about and share traditional foods and preservation practices.[xxi]

In the Pacific, Indigenous Youth in Vanuatu and other small island nations are encouraging their communities to cultivate traditional varieties of foods using Indigenous practices, in order to increase food security and nutritional health.[xxii] In the Solomon Islands and Timor-Leste, Indigenous Youth are working together with Elders and the local government to monitor and sustain Indigenous fisheries and sustainable practices[xxiii] Similarly, Indigenous Youth across Australia are working alongside Elders to sustain their Indigenous food and knowledge systems, re-establish connections and reacquire lost knowledge.[xxiv] In Hawaii, young Kanaka Oiwi (Native Hawaiians) are revitalizing fishponds and restoring Indigenous food and knowledge systems linked to "ahupua'a" watersheds.[xxv] Indigenous Youth in New Zealand are working to reconnect with their traditional *whenua* (lands) and restore spaces for cultivation.[xxvi]

While Indigenous Youth are leading initiatives around the world to protect, preserve and revitalize Indigenous Peoples' food and knowledge systems in the broader context of agrifood systems, there is a lack of disaggregated and published data on their initiatives.

This data gap is slowly being addressed.

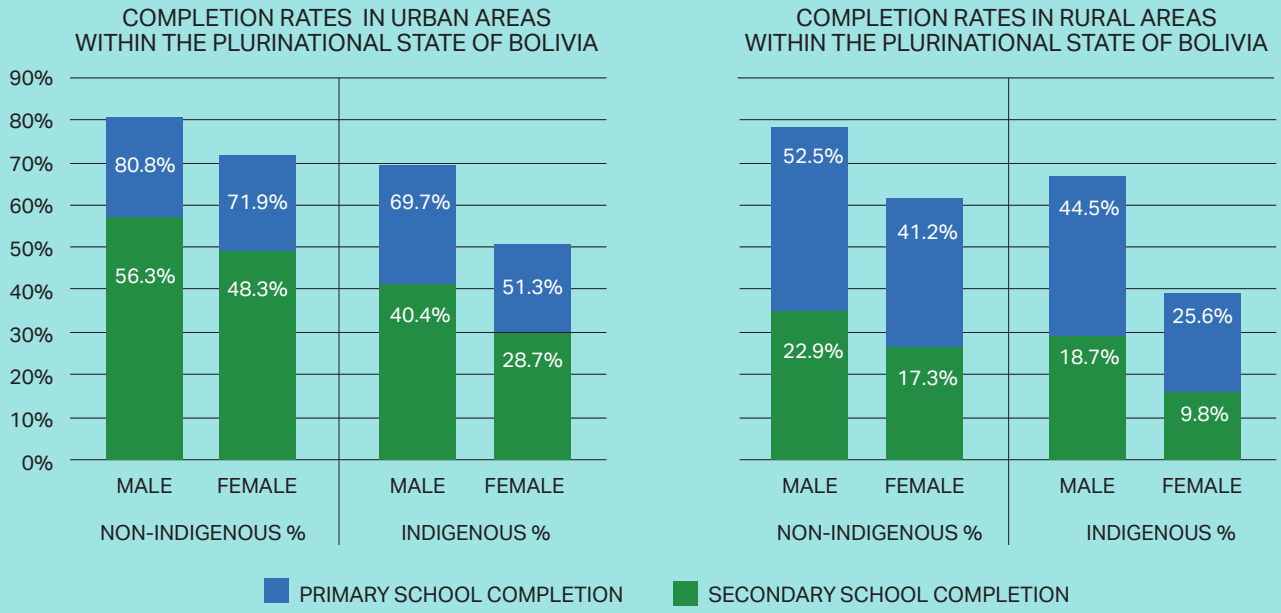
One way to better understand the access and opportunities open to Indigenous Youth is to analyse employment data, although the variations in these data are depending on region and national context. Data from two industrial agrifood systems with large populations of Indigenous Peoples – Australia and the United States of America – demonstrate significant gaps. In Australia, the employment rate in 2021 for Indigenous Youth was 44 percent compared to approximately 60 percent for non-Indigenous Youth. Additionally, 42 percent of Indigenous Youth are not in employment, education or training (NEET). These outcomes are due in part to the challenges that Indigenous Youth and adults face in Australia, including discrimination, disproportionately high rates of incarceration, disparities in the educational system, and lack of access to training and long-term job opportunities, as well as the absence of mentorship for Indigenous Youth seeking employment.[xxvii]

Data from the United States of America (2016) show similar patterns, with unemployment higher for Indigenous Youth aged 20–24 years (24 percent) than for any other ethnic group, and greater for Indigenous Youth aged 16–19 (27 percent) than for all groups except black youth (32 percent). In both cohorts, the unemployment rate for Indigenous Youth is significantly higher than for white youth (19 percent among ages 16–19 and 9 percent for ages 20–24).[xxviii] In the United States of America, 19 percent of young farm workers aged 14–19 were Indigenous (compared to 2 percent for the population overall), and 6 percent spoke an Indigenous language as their primary language.[xxix]

These gaps are reflective of specific challenges that Indigenous Youth face in agrifood systems. These include lack of access to land and water,[xxix] limited participation in policy processes and governance structures,[xxx] reduced access to ICTs compared to urban and/or non-Indigenous Youth,[xxxi] and lower rates of school completion. For example, data from 2011 show that Indigenous Youth in Guatemala were almost 12 percentage points less likely to complete primary school, and almost 13 percentage points less likely to complete secondary school. In Ecuador, Indigenous Youth are more than 16 percentage points less likely to complete secondary school. Further gaps are noticeable between young Indigenous women and men, and between young Indigenous people living in rural and urban areas (see Figure A for statistics on the Plurinational State of Bolivia). While the trend in Latin America improved significantly between 2000 and 2011, and varies across countries in the region, significant gaps – including urban/rural and gender gaps – persist with consequent impacts for Indigenous Youth on skills and labour force participation.[xxxi]

© FAO/ADRIANO GAMBARINI/OPAN
ON RIVER TAPAUÁ IN THE BRAZILIAN AMAZON, A YOUNG MAN SITS ON A WATER VESSEL IN THE LANDS OF THE PAUMARI INDIGENOUS PEOPLE.

FIGURE A. INDIGENOUS YOUTH, ESPECIALLY YOUNG INDIGENOUS WOMEN, ARE LESS LIKELY TO COMPLETE EDUCATION IN RURAL AREAS OF THE PLURINATIONAL STATE OF BOLIVIA



Source: World Bank. 2015. Indigenous Latin America in the twenty-first century. Washington, DC.
https://documents1.worldbank.org/curated/en/145891467991974540/pdf/Indigenous-Latin-America-in-the-twenty-first-century-the-first-decade.pdf

Finally, loss of cultural heritage including the disappearance of Indigenous languages, which is particularly acute among Indigenous Youth, can also contribute to lack of access to resources and job opportunities. For example, in Mexico, the adoption of Spanish as their primary language, by Indigenous Youth from the Cucapa people, has been used to deny them official recognition as Indigenous, thereby reducing their access to fishing rights and land.[xxxii]

Despite these challenges, Indigenous youth are also leading and participating globally in initiatives to retain, restore and revitalize their Indigenous languages, as well as to strengthen the language skills they need in the job market and international negotiations. It is important to note that for many Indigenous Youth, educational systems in their countries have historically been and continue to be a place of assimilation and separation from their cultures, values, systems of knowledge, languages, foods and ways of life. In recognition of this issue, Indigenous-led education initiatives around the world are giving Indigenous Youth a way to access education while also retaining and strengthening these connections and sustaining their food and knowledge systems.[xxxiii, xxxiv]

To gain a better understanding of Indigenous Youth's work and access to assets and resources in agrifood systems, it is important to understand their motivations and the challenges they face in today's world. Options to complete their education under the "mainstream" system and work in the agriculture sector may or may not be accessible, nor serve the goals of protecting and sustaining Indigenous Peoples' food and knowledge systems.

Notes: Refer to the **Notes section** for full citations.

©IFAD/SANTIAGO BILLY/ FACTSTORY IN QUICHÉ, GUATEMALA, JUANA MORALES RODRÍGUEZ, A YOUNG MOTHER OF THREE AND RURAL CREDIT UNION LEADER, USES SOLAR-POWERED DIGITAL TOOLS TO MANAGE GROUP SAVINGS AND GROW HER FAMILY-RUN WEAVING BUSINESS, SHOWING HOW DIGITAL INCLUSION EMPOWERS RURAL WOMEN ENTREPRENEURS.

©FAO/GMB AKASH
IN COX'S BAZAR, BANGLADESH, A YOUNG MEMBER OF A FARMER FIELD SCHOOL WORKS IN HER VEGETABLE FIELD.

05
FOOD SECURITY, NUTRITION AND HEALTHY DIETS FOR RURAL YOUTH

© FAO/GILLES SABRIE
IN CHONGQING, CHINA, A YOUNG EMPLOYEE AT WORK IN THE SMART PLANT FACTORY IN XINGLONG TOWN.

KEY MESSAGES

- Youth is a critical period for biological growth requiring proper nutrition to boost cognitive development with lasting effects on health, academic performance, workforce readiness and earning potential.
- Young people, especially in rural areas, are more likely to experience food insecurity resulting in unhealthy diets and nutrient inadequacy. However, significant and widespread data gaps, particularly in protracted crisis and traditional agrifood systems, hinder understanding of the full scope and severity of these challenges.
- Food insecurity among youth increased from 16.7 percent to 24.4 percent between 2014–2016 and 2021–2023, driven partially by the COVID-19 pandemic and other crises. This increase widened the existing youth–adult gap and was greater among women and rural populations.
- As youth transition from childhood to adulthood, their autonomy and agency regarding food choices gradually increases enabling them to form dietary habits that often persist into adulthood.
- Youth have to navigate challenging biological and social transitions in changing food environments.
- Any agrifood systems transformation that is not sensitive to the challenges and needs of youth may exacerbate existing diet and nutrition-related challenges and inequalities, and/or give rise to new ones.
- Co-creating youth-inclusive agrifood systems means placing healthy diets at the centre of transformation, taking into consideration young people's biological and dietary needs, their sociocultural values and aspirations, and ensuring alignment with their economic situation.

INTRODUCTION

A youth-inclusive agrifood system requires the involvement of young people, not just as participants but as drivers of change, equipped with the skills, resources and agency to make meaningful contributions. Ensuring youth are healthy and well-nourished is fundamental to this vision and begins with access to and the consumption of healthy diets.

Today's youth face significant health-related challenges including food insecurity and a complex malnutrition crisis, characterized by undernutrition, micronutrient deficiencies, and increasing rates of obesity and diet-related non-communicable diseases such as hypertension and diabetes.[1–3] In 2023, an estimated 2.33 billion people worldwide were moderately or severely food insecure.[4] Most of those affected reside in low- and middle-income countries (LMICs), which also host the majority of the global youth population.[4,5] Rising food prices, projected population growth, climate change-induced agrifood losses, and insufficient nutrition, education, and healthcare are likely to exacerbate these challenges.[5–7] These factors could push many youth into highly vulnerable conditions, limiting their ability to access healthy diets and negatively impacting their development, education, health and economic opportunities.[8–10] Unhealthy diets jeopardize the capacity of youth to make effective contributions to agrifood systems and undermine their long-term economic stability and earning potential.[11, 12] Addressing food insecurity and all forms of malnutrition among youth is a crucial step toward empowering young people to contribute to equitable, sustainable and resilient agrifood systems.

Agrifood systems transformation has the potential to foster advancements in agricultural practices, improve market access and promote economic diversification, increasing the availability and accessibility of nutritious and safe food.[13, 14] At present, however, agrifood systems are transitioning in ways that undermine youth nutrition and do not support healthy diets.[15] The widespread availability of unhealthy foods high in sugar, unhealthy fats and salt are displacing traditional diets rich in fruits, vegetables and whole grains, leading to concerning dietary changes even among rural youth.[15] These changes are driven partially by the globalization of food markets and aggressive marketing by national and regional food companies targeting young consumers. The convenience of ultra-processed options, coupled with inadequate regulatory measures, makes it challenging for youth to make informed dietary choices, resulting in adverse health outcomes such as obesity and diet-related non-communicable diseases.[15]

This chapter builds on the conceptual framework introduced in Chapter 1, which identifies food security and nutrition as key outcomes of youth-inclusive agrifood systems transformation. It explores the complex relationships between youth, food security and nutrition within the broader context of agrifood systems transformation. The chapter outlines the nutritional and dietary needs of all youth, emphasizing the risks of food insecurity and malnutrition. It also examines the current state of food security and nutrition among youth, disaggregated by gender, age, geographical location and agrifood system type. Where available, evidence on rural youth nutrition in agrifood systems is emphasized while noting persistent data gaps on dietary intake, particularly from protracted crisis and traditional agrifood systems, and the need for disaggregation of data by sex, age and geography (urban vs rural).[16] Lastly, the chapter presents key sociocultural and economic considerations to guide policies and programmes aimed at improving food security and nutrition outcomes for young people.

NUTRITIONAL CONSIDERATIONS FOR YOUTH-INCLUSIVE AGRIFOOD SYSTEMS TRANSFORMATION

YOUTH IS A PERIOD OF SIGNIFICANT BIOLOGICAL CHANGE REQUIRING PROPER NUTRITION

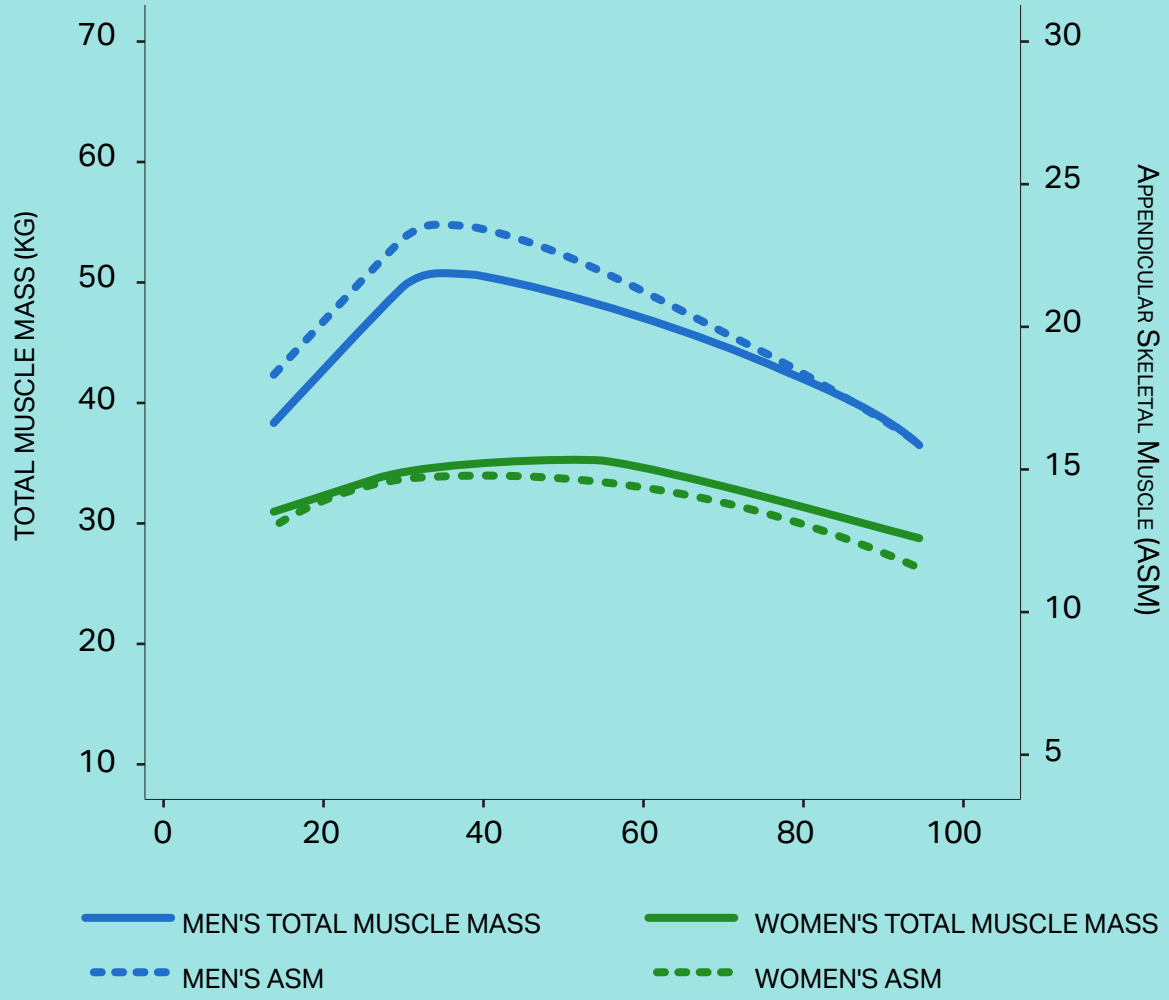
Proper nutrition from preconception through early adulthood is crucial for healthy growth, development and long-term health. Changes in body composition, including bone, muscle and fat distribution affect long-term metabolic, muscular and skeletal health. Linear growth begins before birth, with bone mass peaking at 20–30 years, followed by gradual bone loss later in life, with females experiencing a period of rapid bone loss during menopause.[17,18] Young females typically grow taller earlier than males, but young males tend to gain more muscle.[19] Skeletal muscle growth continues to develop throughout youth, with muscle development peaking in the 30s for males and 40s for females (Figure 5.1).[20]

Brain development also continues well into a person's

©FAO/EDUARDO SOTERAS
IN NAIROBI, KENYA, A YOUNG FARMER TENDS TO HERBS.

FIGURE 5.1

SKELETAL MUSCLE GROWTH PEAKS IN THE THIRTIES FOR MALES AND FORTIES FOR FEMALES



Note: Total muscle mass refers to the total amount of muscle tissue in the body. ASM (kg) refers to a skeletal muscle mass index that comprises the sum of muscle mass in the arms and legs, adjusted for body size.

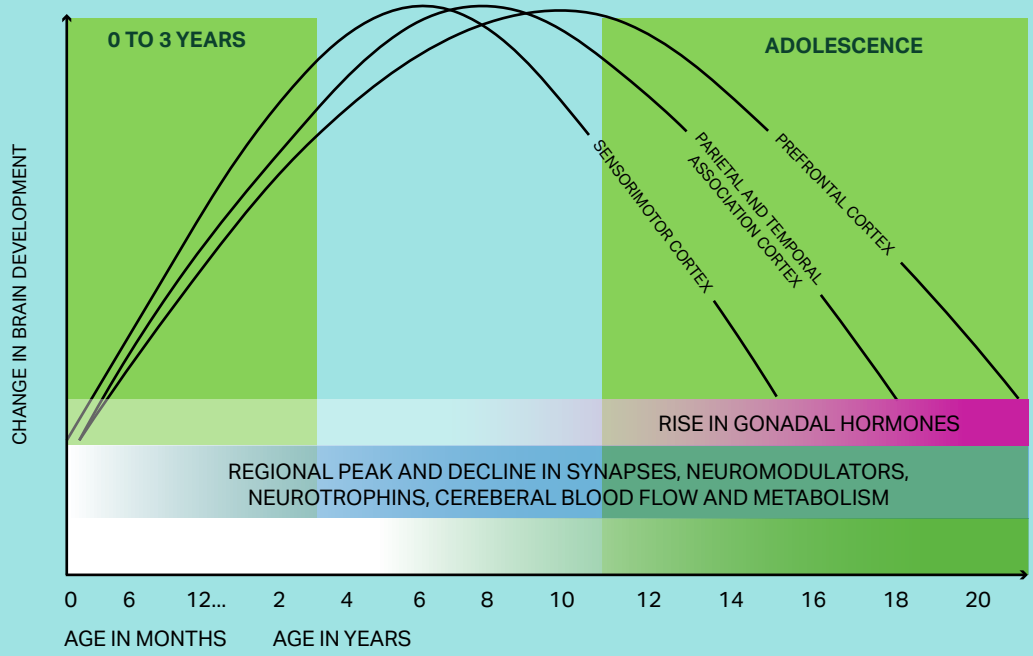
Source: Adapted from Kim, K.M., Jang, H.C. & Lim, S. 2016. Differences among skeletal muscle mass indices derived from height-, weight-, and body mass index-adjusted models in assessing sarcopenia. The Korean Journal of Internal Medicine, 31(4): 643–650. https://doi.org/10.3904/kjim.2016.015. Data on age trends in total muscle mass and appendicular skeletal muscle (ASM)* indices of 28 476 males and females are drawn from the Korea National Health and Nutrition Examination Survey 2008–2010.

mid-20s, especially in areas responsible for decision-making, impulse control and planning. The extent of development is influenced by hormones, myelination (Figure 5.2)[21] and other biological systems[19] as well as lifestyle factors such as diet, activity levels and overall health. The brain remains highly adaptable or "plastic" to social, learning, and nutritional environments.[19] While this process enhances the ability to learn and adjust to new experiences, it also makes young people more vulnerable to negative influences such as poor nutrition.[19] Additionally, while the immune system functions similarly to that of adults, by late childhood it undergoes sex-specific hormonal changes during puberty and into youth.[19] By the end of puberty, the body reaches full physical maturity, preparing for reproduction. Sexual maturation and social relationships during youth are critical for future parenthood, as reproductive health is best when physical, mental, social and emotional development is fully complete.[19] Cumulatively, these factors indicate that youth, especially the period from 20 to 24 years, represents a critical phase of development with the potential to shape lifelong health and well-being.

©FAO/LUIS TATO IN SIAYA, KENYA, SARAH JUMA, A MEMBER OF THE COMMUNITY-BASED GROUP SIDIPO, HOLDS FRESHLY HARVESTED MANGOES AT HER HOME, REFLECTING THE VITAL ROLE OF YOUNG WOMEN IN STRENGTHENING RURAL AGRIFOOD SYSTEMS.

FIGURE 5.2

YOUTH SPANS SENSITIVE PERIODS OF BRAIN DEVELOPMENT



Source: Gee, D.G. & Casey, B.J. 2015. The impact of developmental timing for stress and recovery. Neurobiology of Stress, 1: 184–194. https://doi.org/10.1016/j.ynstr.2015.02.001

DUE TO RAPID PHYSICAL GROWTH AND ACTIVITY, YOUTH DIETARY NEEDS DIFFER FROM OTHER AGE GROUPS.

Adequate nutrition is needed to support the biological changes that occur as youth transition from childhood to adulthood.[19] Nutrients are the essential substances the body needs for growth, development and function. Macronutrients (those required in larger amounts), including carbohydrates, proteins and fats, provide energy and are essential for muscle and organ development. Micronutrients (those required in smaller amounts), including over 20 essential vitamins and minerals, are critical for proper functioning of all body systems, including brain development and immune system function.[22] Inadequate, unbalanced or excessive nutrient intake results in visible forms of malnutrition (e.g. low or excess weight), but also in functional changes in the body that may not be easily detected (e.g. changes in organ and brain development, and immune function, among others).

Youth have greater dietary energy and nutrient (see Table 5.1 and Table A5.2 in the Appendix 5) needs than other age groups due to rapid physical growth and activity. Their need for nutrients such as calcium, zinc and iron is especially high.[16] These micronutrient density needs are even greater for adolescents (10–19 years), adolescent girls, youth (15–24 years), and pregnant and lactating females relative to the global average across all life stages (see Box 5.1).[23]

TABLE 5.1 YOUTH HAVE HIGHER DIETARY NUTRIENT NEEDS THAN OTHER AGE GROUPS

	MALES				FEMALES				PREGNANCY			LACTATION		
AGE (YEARS)	9–13	14–18	19–30	31–50	9–13	14–18	19–30	31–50	14–18	19–30	31–50	14–18	19–30	31–50
MACRONUTRIENTS														
CARBOHYDRATE (G/D)	100	100	100	100	100	100	100	100	135	135	135	160	160	160
PROTEIN (G/KG/D)	0.76	0.73	0.66	0.66	0.76	0.71	0.66	0.66	0.88	0.88	0.88	1.05	1.05	1.05
MINERALS														
CALCIUM (MG/D)	1 100	1 100	800	800	1 100	1 100	800	800	1 000	800	800	1 000	800	800
SELENIUM (RG/D)	35	45	45	45	35	45	45	45	49	49	49	59	59	59
MAGNESIUM (MG/D)	200	340	330	350	200	300	255	265	335	290	300	300	255	265
ZINC (MG/D)	7.0	8.5	9.4	9.4	7.0	7.3	6.8	6.8	10.5	9.5	9.5	10.9	10.4	10.4
IRON (MG/D)	5.9	7.7	6	6	5.7	7.9	8.1	8.1	23	22	22	7	6.5	6.5
IODINE (RG/D)	73	95	95	95	73	95	95	95	160	160	160	209	209	209
WATER-SOLUBLE VITAMINS														
VITAMIN C (MG/D)	39	63	75	75	39	56	60	60	66	70	70	96	100	100
THIAMINE (MG/D)	0.7	1.0	1.0	1.0	0.7	0.9	0.9	0.9	1.2	1.2	1.2	1.2	1.2	1.2
RIBOFLAVIN (MG/D)	0.8	1.1	1.1	1.1	0.8	0.9	0.9	0.9	1.2	1.2	1.2	1.3	1.3	1.3
NIACIN (MG/D)[1]	9	12	12	12	9	11	11	11	14	14	14	13	13	13
VITAMIN B6 (MG/D)	0.8	1.1	1.1	1.1	0.8	1.0	1.1	1.1	1.6	1.6	1.6	1.7	1.7	1.6
VITAMIN B12 (RG/D)	1.5	2.0	2.0	2.0	1.5	2.0	2.0	2.0	2.2	2.2	2.2	2.4	2.4	2.4
FOLATE (RG/D)[2]	250	330	320	320	250	330	320	320	520	520	520	450	450	450
FAT-SOLUBLE VITAMINS														
VITAMIN A (RG/D)[3]	445	630	625	625	420	485	500	500	530	550	550	885	900	900
VITAMIN D (RG/D)	10	10	10	10	10	10	10	10	10	10	10	10	10	10
VITAMIN E (MG/D)[4]	9	12	12	12	9	12	12	12	12	12	12	16	16	16

Note: An Estimated Average Requirement (EAR) is the average daily nutrient intake level estimated to meet the requirements of half of the healthy individuals in a group. EARs for youth (15–24 years) are shaded in green for males and orange for females. EARs have not been established for vitamin K, pantothenic acid, biotin, choline, chromium, fluoride, manganese, potassium, sodium, chloride or other nutrients not yet evaluated via the dietary reference intakes process.[1]Niacin equivalents (NE): 1 mg of niacin = 60 mg of tryptophan.[2]Dietary folate equivalents (DFE): 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach.[3]Retinol activity equivalents (RAEs): RAE = 1 Rg retinol, 12 Rg G-carotene, 24 Rg F-carotene, or 24 Rg G-cryptoxanthin. The RAE afor dietary provitamin A carotenoid is twice that of retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.[4]F-tocopherol: F-Tocopherol includes *RRR*-F-tocopherol, the only form of F-tocopherol that occurs naturally in foods, and the *2R*-stereoisomeric forms of F-tocopherol (*RRR*-, *RSR*-, *RRS*- and *RSS*-F-tocopherol) that occur in fortified foods and supplements. It does not include the *2S*-stereoisomeric forms of F-tocopherol (*SRR*-, *SSR*-, *SRS*- and *SSS*-F-tocopherol), also found in fortified foods and supplements.

Source: Institute of Medicine (US) Panel on Micronutrients. 2001. *Dietary reference intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc.* Washington, DC, National Academies Press. www.ncbi.nlm.nih.gov/books/NBK222310

PROPER NUTRITION DURING YOUTH SUPPORTS LONG-TERM HEALTH, WORKFORCE READINESS, AND ECONOMIC PRODUCTIVITY.

Ensuring adequate nutrition during the critical youth period has long-term consequences for dietary habits, overall health and human capital. Healthy diets – adequate, balanced, moderate and diverse – ensure strong immunity, proper development and lifelong well-being.[25] Chronic undernutrition, especially micronutrients deficiencies, can weaken the immune system,[26–28] disrupt cognitive functions and brain development, impair reasoning abilities, delay puberty[19] and increase risks of complications during pregnancy and childbirth among young mothers and their offspring.[29] Maternal malnutrition – whether undernutrition or obesity – before and during pregnancy influences the growth and health of their offspring as well as the future risk of conditions like diabetes.[19] It also increases the likelihood of low birth weight, pre-term birth and stunting, with intergenerational consequences for the health of both mothers and their offspring throughout life (see also Box 5.1 on youth and adolescent pregnancy).[19]

At the same time, overweight and obesity driven by high fat, sugar and processed diets contribute to chronic inflammation, early puberty[19] and long-term risks like diabetes and reproductive issues.[19, 30] They can also impair brain function and self-regulation, potentially leading to neurodevelopmental challenges including impulsive behaviours,[19, 31] attention disorders, depression and anxiety.[32, 33] Overweight and obesity during pregnancy can increase the risk of pregnancy complications, infant morbidities, and future obesity and metabolic diseases in offspring.[34, 35]

Nutrition also directly impacts educational and economic outcomes. Adequate nutrition enhances cognitive function, leading to better concentration, academic achievement and school completion.[36] Higher educational attainment opens doors to better employment opportunities,[37, 38] increasing the likelihood of stable income and access to healthy foods later in life. Conversely, malnourished youth often struggle academically due to impaired cognitive development, increased absenteeism and higher dropout rates, which significantly reduce future employment prospects and economic stability.[36] Those who enter the workforce malnourished may struggle with physical limitations, low productivity and frequent absenteeism, which reduce their economic contribution.[11, 12, 39, 40]

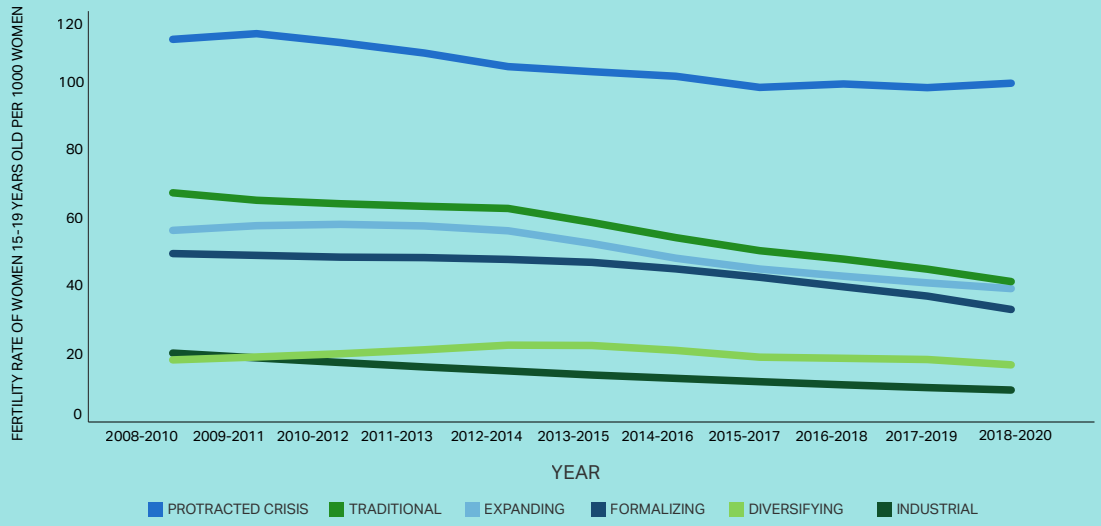
©FAO/ANIS MILI IN BEJA, TUNISIA, YOUNG AGRI-ENTREPRENEUR AHED MOUSSI ARRANGES PACKETS OF HERBS ON SHELVES AT HER DISTILLATION WORKSHOP, WHERE SHE TRANSFORMS LOCAL HERBS AND FLOWERS INTO HIGH-VALUE PRODUCTS.

BOX 5.1 ADOLESCENT AND YOUTH PREGNANCY

Adolescents and pregnant and lactating women have higher daily caloric needs and specific micronutrient requirements. In many countries and across agrifood system types, many women have their first child while still in the younger youth category (15—17), placing specific demands on their nutrition, with implications for their education, livelihoods and health outcomes.

In 2019, there were 21 million pregnancies among adolescent girls aged 15–19. About 50 percent were unintended, resulting in 12 million births,[i] 95 percent of which occurred in low- and lower-middle-income countries.[ii] Pregnancy and childbirth carry higher risks for adolescents than older women, including pre-eclampsia, eclampsia, systematic infections, iron deficiency, anaemia and fistulae. These conditions are also associated with negative outcomes for infants including higher rates of pre-term birth, low birth weight, stillbirths and neonatal deaths.[ii] Additionally, complications from pregnancy and childbirth are a leading cause of death for girls aged 15–19.[iii]

FIGURE A. ADOLESCENT FERTILITY RATES, BY AGRIFOOD SYSTEM TYPOLOGY



Note: 1. To improve the coverage of adolescent fertility data across countries and years, linear interpolation was used to estimate missing values for countries with at least two data points. Adolescent fertility rates were then aggregated by agrifood system typology as population-weighted averages. Three year moving averages were applied to smooth short-term fluctuations. 2. The number of countries covered in the analysis ranged from 11 to 19 in protracted crisis agrifood systems (depending on the time period); 25–30 for traditional agrifood systems; 19–30 for expanding agrifood systems; 30 throughout for formalizing agrifood systems; 27–28 for diversifying agrifood systems; and 28–29 for industrial and agrifood systems.

Source: Authors' computations based on WHO 2025 data for adolescent birth rates (per 1 000 women) [Indicator]. http://data.who.int/indicators/i/24C65FE/27D371A [Cited April 2025]; and World Bank staff estimates using the World Bank's total population and age/sex distributions of the United Nations Population Division's World Population Prospects: 2024 Revision, Population, ages 15–19, female. https://databank.worldbank.org/reports.aspx?source=2&series=SP.POP.1519.FE.5Y [Cited April 2025].

Adolescent pregnancy also interferes with schooling, carries stigma, especially if it occurs outside of marriage, and can perpetuate cycles of poverty.[iv] It is facilitated by declining but still high rates of child marriage (650 million women alive today were married before their 18th birthday),[v] high rates of poverty, restrictive gender norms, and unmet needs for and knowledge of contraception. These pregnancies are more prevalent in low-income countries and rural areas.[vi] For example, in Zambia, adolescent girls aged 15–19 in rural areas are twice as likely to have given birth as those in urban areas. The percentage of girls in this age group who were pregnant or had already given birth ranged from 14.9 percent in the capital city, Lusaka, to 43 percent in the rural/agricultural areas of the Southern Province.[vii]

BOX 5.1 ADOLESCENT AND YOUTH PREGNANCY

Adolescent fertility rates are highest in countries at the earliest stages of structural transformation, with rates declining as agrifood systems transition (see **Figure A**). The highest rates are observed in countries facing protracted crises, where early and forced marriages and limited reproductive autonomy are often coping mechanisms in response to displacement and instability, and sometimes constitute an attempt to protect girls and young women from more violence.[viii] The lowest rates of adolescent fertility are seen in industrial agrifood systems, which aligns with global patterns in more developed countries, where needs for contraceptives are better met, and extended education and delayed family formation are common.

Notes: Refer to the **Notes section** for full citations.

STATUS OF YOUTH DIETARY INTAKE AND FOOD INSECURITY

YOUTH DIETS ARE OFTEN POOR AND LACK ESSENTIAL NUTRIENTS

The extent of global data on youth dietary patterns is limited with most of the available data coming from industrialized agrifood systems and upper-middle and high-income countries, rather than from traditional agrifood systems or low- or lower-middle-income countries (see Box 5.2). Ethiopia and India are notable exceptions, providing data from traditional agrifood systems. The most comprehensive national dietary data (quantitative and covering the entire diet) are available for Australia, East Asia, Europe, Northern America and South America. There are no data available for many countries in sub-Saharan Africa. The absence of such data undermines the design of effective youth-focused nutrition policies and programmes in many countries.[16]

> **DATA GAPS HINDER UNDERSTANDING OF YOUTH NUTRITION, ESPECIALLY IN PROTRACTED CRISIS CONTEXTS.**

Available dietary data[41] show poor dietary patterns among youth, often marked by inadequate intake of essential nutrients (see Figure 5.3 and Box 5.3). Typical youth diets are characterized by low consumption of fruits and vegetables and high consumption of carbonated soft drinks and fast food, with differences by region and gender.[41–44]

Micronutrient intake inadequacies are more common among youth living in East Asia and the Pacific, Latin America and the Caribbean, and South Asia.[45] Insufficient intake is most common for vitamin E, iron, calcium and iodine. Vitamin E deficiency is common among young people due to inadequate dietary intake, rapid growth and low vitamin stores from childhood, which can lead to long-term health consequences,

BOX 5.2 DATA GAPS

Limited information on adolescent and youth (10–24 years) diets is available in 61.8 percent of countries, with only 11.2 percent of countries recording detailed food intake at the national or subnational level.[i] When adolescent data are available, 46.4 percent come from high-income countries.[i] Adolescent diet data from surveillance systems in high-income countries (Australia, Canada, New Zealand and the United States of America) present severe limitations in terms of data quality and comparability.[i] Less than half (42.8 percent) of papers identified in a systematic review disaggregated their findings by sex and those that did revealed the absence of data on dietary intake among adolescent boys in lower-income countries.[i] Furthermore, there is a need for data on how modern agrifood systems are affecting youth diets and nutrient intake across regions and different subgroups.

Data scarcity is location-specific, with the least data reported in Africa.[i] Data on rural youth is even scarcer. The available data on youth nutrition are scattered across various databases, which often consolidate records without providing aggregated data on nutritional indicators. Platforms like the FAO/WHO Global Individual Food Consumption Data Tool consolidate datasets from multiple countries and allow filtering by age range (e.g. 15–24 years) and urbanicity, in order to access data on food consumption, nutrition (e.g. food sources of micronutrients and macronutrients), dietary diversity and environmental factors (e.g. estimated impact of greenhouse gas emissions by food group).[ii] While efforts are being made to consolidate data sources, at present researchers must search individual datasets, articles or demographic and health surveys to gather information on nutrition indicators of interest.[iii–v]

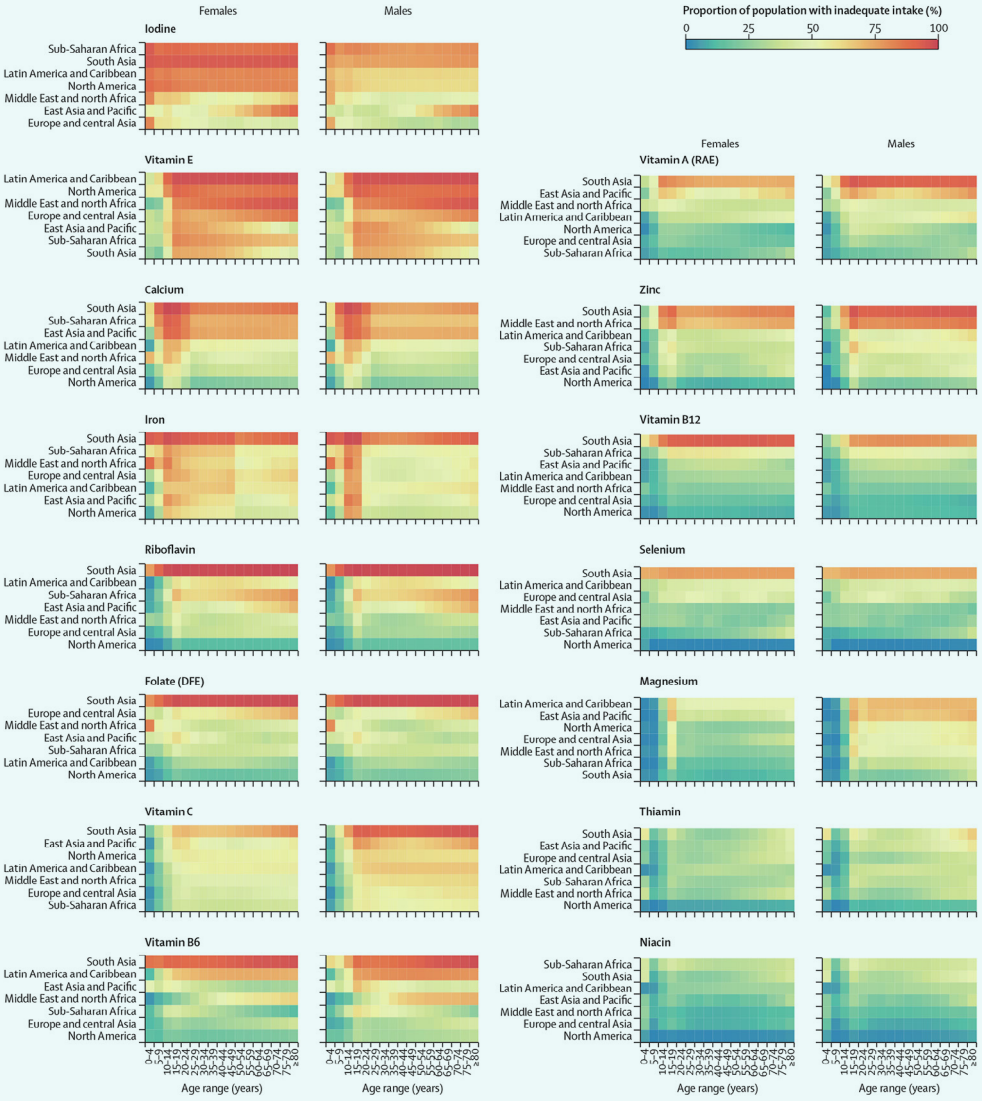
Notes: Refer to the **Notes section** for full citations.

©FAO/JAVID GURBANOV
IN BILASUVAR DISTRICT, AZERBAIJAN, A YOUNG BEEKEEPER SERVES HOMEMADE BAKLAVA SWEETENED WITH HONEY FROM HIS OWN HIVES.

FIGURE 5.3

INTAKE AMONG YOUTH IS INADEQUATE FOR MANY NUTRIENTS

Proportion of younger and older youth with inadequate intake of select nutrients, by sex and region



Source: Passarelli, S., Free, C.M., Shepon, A., Beal, T., Batis, C. & Golden, C.D. 2024. Global estimation of dietary micronutrient inadequacies: A modelling analysis. The Lancet Global Health, 12(10): e1590–e1599. https://doi.org/10.1016/S2214-109X(24)00276-6

including increased risk for non-communicable diseases.[46–48] Iron deficiency and anaemia are common among youth aged 10–24, and highest in South Asia and sub-Saharan Africa, although deficiencies in South Asia declined from 1990 to 2015.[49] Younger children and adolescents are at risk of zinc and calcium deficiencies due to changes in zinc levels in the blood and increases in calcium demands during growth spurts.[50] Insufficient intake of iodine is a concern during youth, with large regional variability.[49] Males and younger youth generally present higher micronutrient inadequacies than females and older youth,[45] although the burden of nutrient deficiencies in youth is greater among females.[49] Pregnancy in early youth causes an increased risk of developing micronutrient deficiencies to support both the foetus and mother.[51, 52]

Compounding these issues, excess energy intake has led to a steady increase in the global prevalence of obesity across all sex and income groups, disproportionately affecting those in higher-income groups.[53] This trend highlights the dual burden of malnutrition – undernutrition alongside overweight and obesity – that youth face today with rapidly evolving agrifood systems. Health status is becoming progressively worse with the most serious effects observed among lower income youth. As with food insecurity, the risk of poor diets and nutrient inadequacy is not equally distributed across youth, with disparities arising from socioeconomic, regional and gender differences. Socioeconomic status influences diet quality, as youth from lower-income families often consume nutrient-poor, energy-dense foods due to financial constraints.[54]

DRIVERS OF YOUTH FOOD INSECURITY

Food security is achieved when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".[22] Food security encompasses food availability, economic and physical access, food utilization, stability over time, agency and sustainability. In recent years, the global prevalence of food insecurity and malnutrition among youth has risen significantly. This rise reflects agrifood systems transitions that do not adequately support healthy diets and are influenced by broader forces such as climate change,[7] conflicts,[55–57] globalization[6, 22] and migration.[58–60] These dynamics alter rural food environments, increasing exposure to processed foods and impacting what and how young people eat.

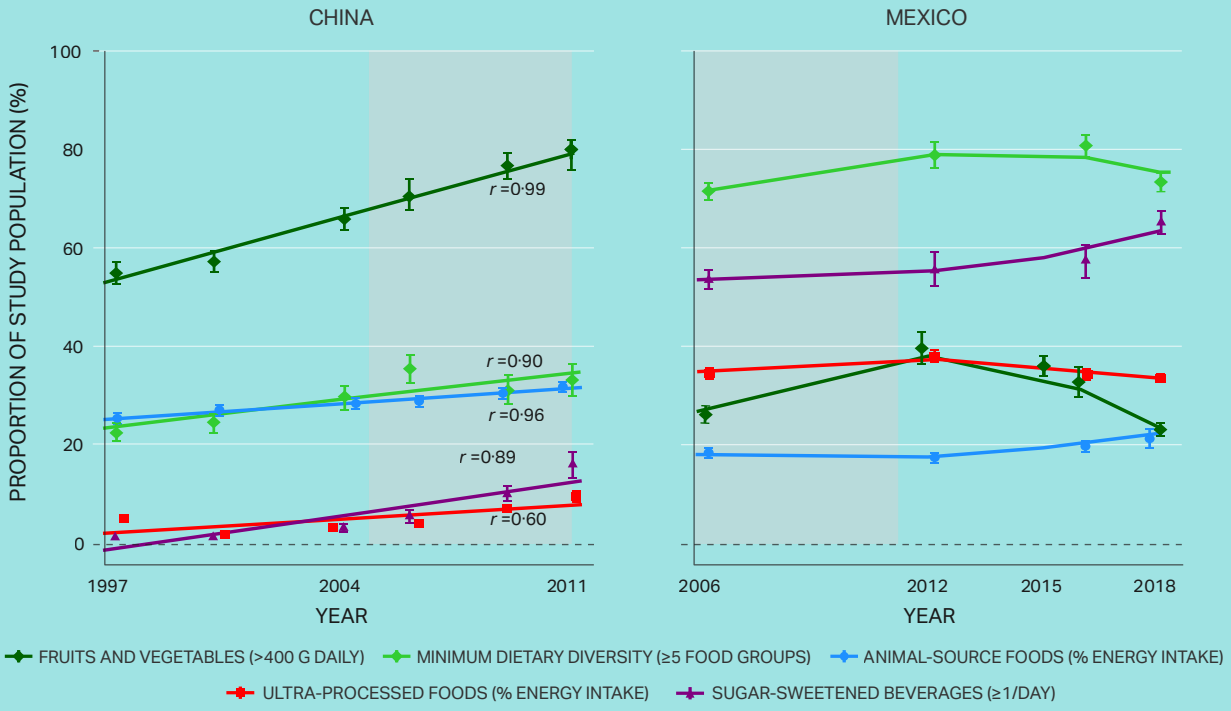
© **FAO/MATTIA ROMANO** IN ASTANA, KAZAKHSTAN, BREAD MARKET SELLERS MURATZHAM PATTARKULOV AND NAGIMA SERIMKULOVA PREPARE UZBEK TANDYR NAN BREAD COOKED IN A VERTICAL CLAY OVEN, THE TANDYR.

BOX 5.3 CONTEXT AND COHORT-SPECIFIC DIETARY TRENDS

A study of adolescent boys and girls in China (8 015 participants aged 10–19 years, 1997–2011) and Mexico (18 121 participants aged 12–19 years, 2006–2018) reveals changes in common dietary indicators, showing both progress and setbacks in nutrition.[i] In China, the daily consumption of more than 400 g of fruits and vegetables – the amount recommended to reduce the risk of non-communicable diseases[ii] – increased slowly but remained below half the population by 2011. In Mexico, fruit and vegetable consumption rose between 2006 and 2012 to nearly 40 percent but dropped by 2018, with only one in five adolescents meeting the target.

Dietary diversity in these two countries followed a similar trend. In China, the share of youth consuming five or more food groups daily rose to 80 percent by 2011 (Figure A). In Mexico, minimum dietary diversity remained 70 percent from 2006 to 2015 before declining by 2018. Animal-source foods persisted as a consistent part of daily diets in both countries, increasing slightly over time and higher in China than Mexico, contributing to less than a third of adolescents' total energy intake.

FIGURE A. DIETARY TRENDS IN CHINA AND MEXICO



Note: Error bars show 95-percent confidence interval. China: bivariate linear regression. Mexico: smoothing splines. r=Pearson's correlation coefficient (p<0·01). Shaded area represents overlapping years.

Source: Neufeld, L.M., Andrade, E.B., Ballonoff Suleiman, A., Barker, M., Beal, T., Blum, L.S., Demmler, K.M. et al. 2022. Food choice in transition: Adolescent autonomy, agency, and the food environment. *The Lancet*, 399(10320): 185–197. https://doi.org/10.1016/S0140-6736(21)01687-1

BOX 5.3 CONTEXT AND COHORT-SPECIFIC DIETARY TRENDS

Consumption of ultra-processed foods and sugar-sweetened beverage intake differs between the two countries. Ultra-processed food contributed to less than 10 percent of energy intake among the study population in China, but nearly 40 percent of the energy intake among the study population in Mexico. For adolescents in China, consumption of at least one sugary drink per day rose from nearly 0 percent to 10 percent of the study population by 2011, whereas for adolescents in Mexico, more than half consumed one or more sugary drink daily in 2006, surpassing 60 percent by 2018.

Notes: Refer to the **Notes section** for full citations.

"FOOD INSECURITY AMONG YOUTH INCREASED FROM 16.7 PERCENT IN 2014–2016 TO 24.4 PERCENT IN 2021–2023, WIDENING THE YOUTH-ADULT GAP.

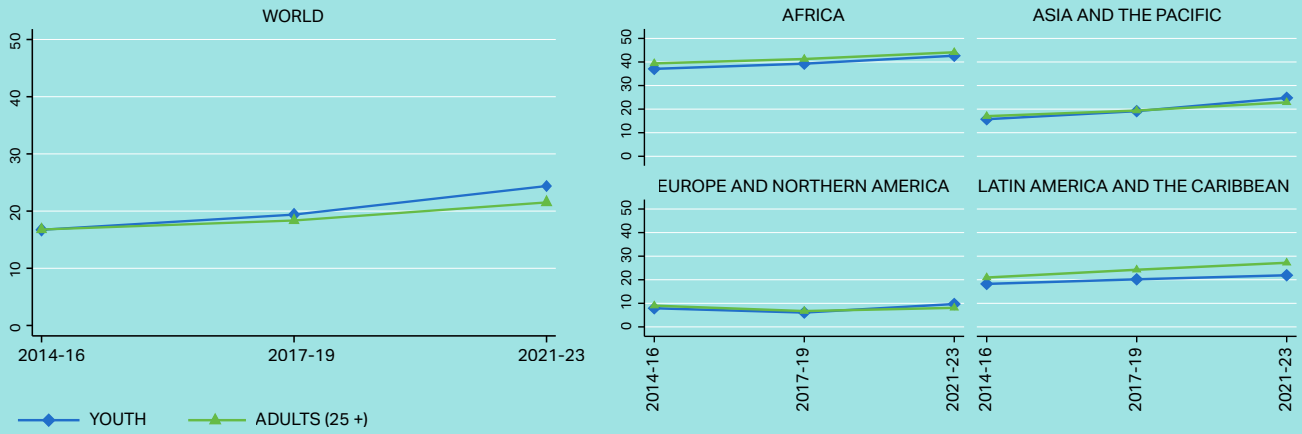
Globally, the prevalence of moderate or severe food insecurity among youth aged 15–24 increased significantly from 16.7 percent in 2014–2016 to 24.4 percent in 2021–2023 (Figure 5.4). This rise among youth outpaced that observed among adults aged 25 and over, whose food insecurity increased from 16.7 percent to 21.5 percent over the same period. This increasing gap between youth and adults is in part attributable to the disproportionate impact of the COVID-19 pandemic on young people.[61]

Regionally, youth in Africa experienced the highest prevalence of food insecurity both in 2014–2016 (37.1 percent) and in 2021–2023 (42.7 percent), while youth in Europe and Northern America reported the lowest rates, increasing from 8.0 percent to 9.7 percent over the same period (Figure 5.4). Asia and the Pacific witnessed the steepest regional increase in youth food insecurity, rising from 15.7 percent in 2014–2016 to 24.8 percent in 2021–2023. In both Asia and the Pacific and Europe and Northern America, youth food insecurity levels surpassed those of adults in the most recent period (respectively, 24.8 percent versus 22.9 percent, and 9.7 percent vs. 8.1 percent) in 2021–2023.

FIGURE 5.4

RISK OF MODERATE TO SEVERE FOOD INSECURITY HAS RISEN AMONG YOUTH

Prevalence of moderate or severe food insecurity (%)



Note: Prevalence of moderate or severe food insecurity among youth and adults (25+). The prevalence is adjusted to account for the global youth and non-youth population.

Source: Macchioni. G.A., Mane E., Viviani, S. & Cafiero, C. (forthcoming). Youth vulnerability to food insecurity: Evidence from 141 countries. ESP Working paper series. Rome, FAO.

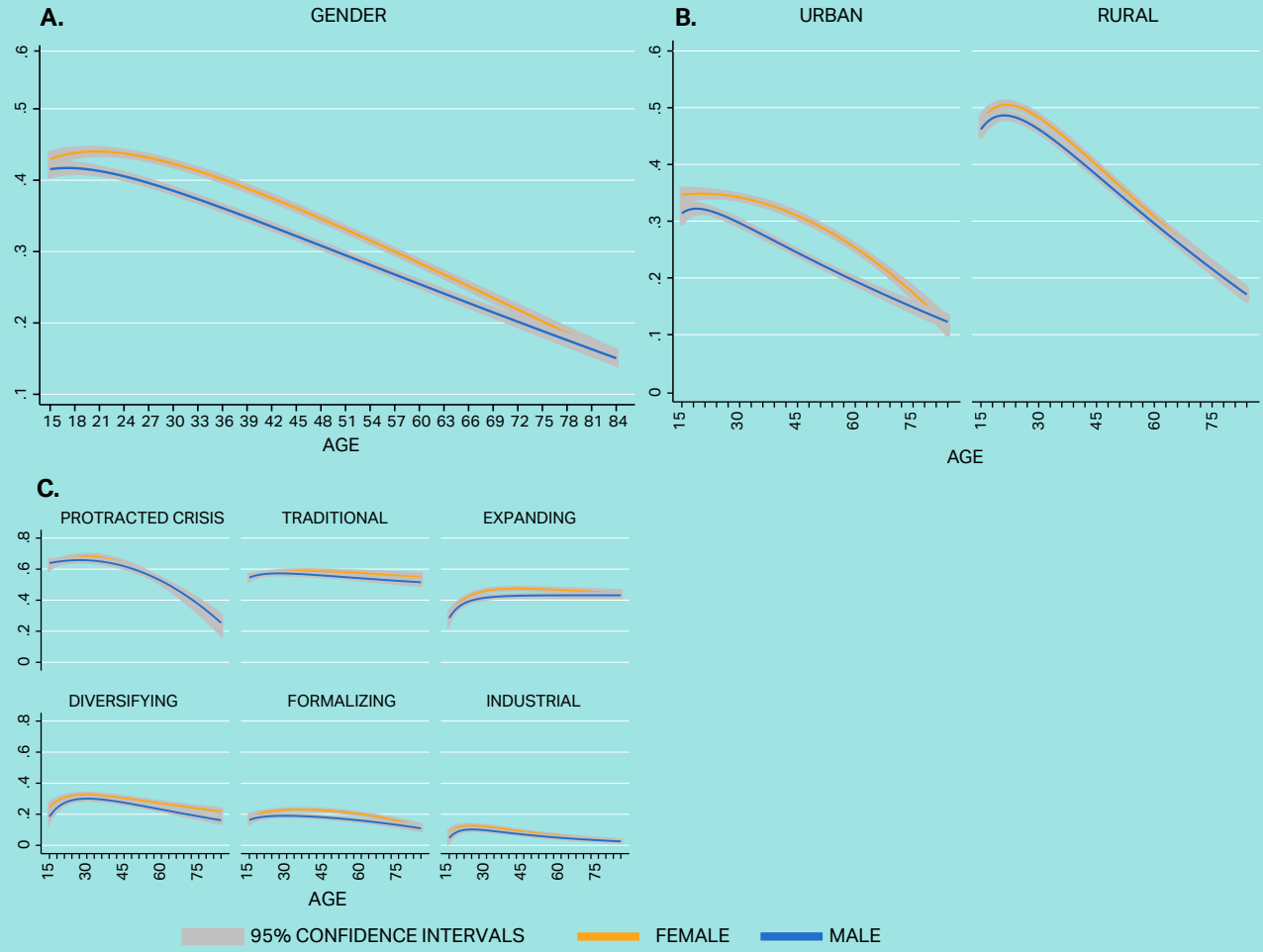
The likelihood of experiencing moderate or severe food insecurity varies with age. Youth aged 15–24 have the highest probability of experiencing food insecurity compared to all other age groups. A gender gap is evident across all age groups but is less pronounced among younger youth (aged 15–17) than older youth (aged 18–24) (Figure 5.5A). Among males, food insecurity remains relatively stable throughout youth and declines with age in adulthood. In contrast, among females, food insecurity increases steadily through adolescence, peaking in the mid-20s before declining in later adulthood.

Rural populations face higher levels of food insecurity than their urban counterparts. For rural males, the probability of food insecurity peaks in the early 20s, while for rural females, it peaks in the mid-20s (Figure 5.5B). The gender gap in food insecurity persists across all age groups and is more pronounced in urban areas, where it reaches the highest levels among adults in their mid-30s to early 60s. Among younger youth, this gap is comparatively smaller, indicating age-specific dynamics at the intersection of gender, location and vulnerability to food insecurity.

FIGURE 5.5

RISK OF MODERATE TO SEVERE FOOD INSECURITY IS HIGHER AMONG YOUTH, FEMALES AND RURAL POPULATIONS

Age-specific predicted probability of moderate and severe food insecurity in 2021–2023, (A) by gender, (B) by gender and urban and rural location, and (C) by agrifood system typology



Note: Based on an analysis of individual-level data from 141 countries collected by FAO through the Gallup World Poll from 2014 and 2023. The graphs present data-driven predictions of the probability of experiencing moderate or severe food insecurity, estimated using a fractional polynomial of age. This probability for each cohort shown is not directly comparable to official aggregated statistics available in FAOSTAT. Additionally, weighting applies within each country but not at the global level.

Source: Macchioni. G.A., Mane E., Viviani, S. & Cafiero, C. (forthcoming). Youth vulnerability to food insecurity: Evidence from 141 countries. ESP Working paper series. Rome, FAO.

The relationship between food insecurity and age varies substantially across agrifood systems for both women and men (Figure 5.5C). Agrifood systems at the early stages of transition, such as protracted crisis and traditional systems, exhibit the highest prevalence of food insecurity. In protracted crisis agrifood systems, food insecurity displays the greatest age-related variation, peaking at approximately 65 percent among individuals in their 30s before declining sharply after age 40. In traditional agrifood systems, food insecurity also peaks in the 30s, reaching around 60 percent, but remains above 50 percent across older age groups.

In agrifood systems undergoing intermediate stages of transition, such as expanding systems, and diversifying systems, the probability of food insecurity increases more steeply with age, peaking in the 30s and then declining in later adulthood. In both agrifood systems categories, women are significantly more likely than men to experience food insecurity. As agrifood systems continue to transition, the problem of food insecurity decreases. In formalizing agrifood systems, the risk of food insecurity is relatively low in youth, with minimal gender disparities up to age 20. However, gender differences emerge in early adulthood, with women facing higher and increasing probabilities of food insecurity through lates stages of life. In industrial agrifood systems, youth, and particularly young women, face a greater probability of food insecurity.

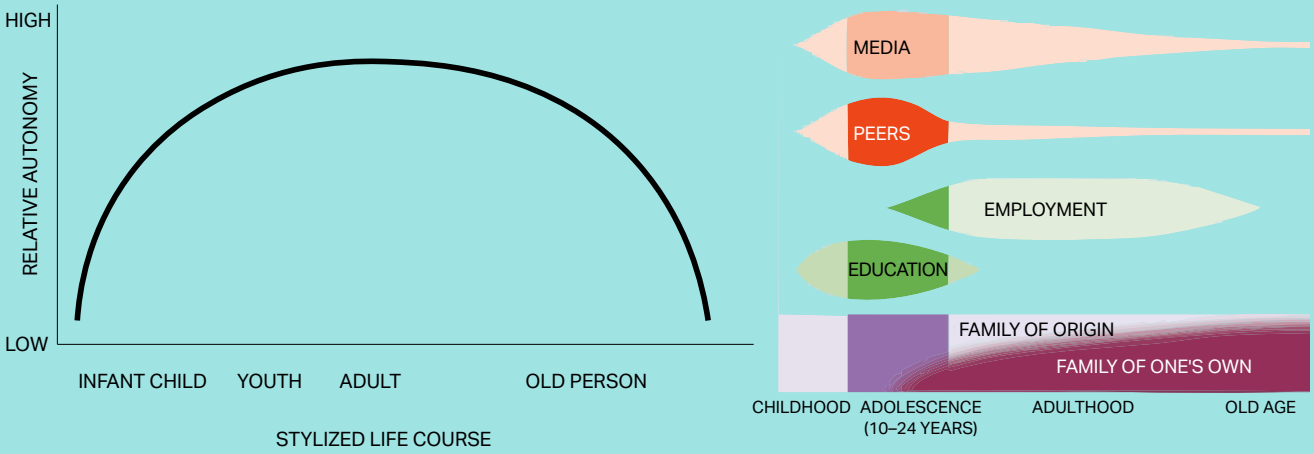
SOCIOCULTURAL AND ECONOMIC INFLUENCES ON YOUTH DIETS

Beyond its nutritional value, food helps youth to navigate their social world.[63] Youth diets evolve as they transition through different social relationships and environments, shifting from parental influences to that of their peers and partners.[16, 64–73] While independence generally increases with age, the ability to make informed and independent food choices –– known as autonomy and agency – develops throughout youth and beyond. This process is also mediated by various social and structural factors.[74, 75] Between the ages of 14 and 24 years, brain development, particularly in areas responsible for decision-making (myelination of the medial prefrontal cortex), strengthens youth's ability to form personal preferences and make more confident choices (Figure 5.6).[76] However, food-related decision are not made in isolation. Social and cultural norms, access to resources, and personal factors such as gender, birth order and socioeconomic status, all shape the ability of youth to make independent food-related decisions.[16, 63, 68, 77–84] This section discusses the social, cultural and economic influences shaping youth diets, to help guide policies and programmes that promote healthy eating habits and address barriers to nutritious food access.

> **"YOUTH DIETS EVOLVE AS THEY TRANSITION THROUGH DIFFERENT SOCIAL RELATIONSHIPS AND FOOD ENVIRONMENTS.**

FIGURE 5.6

FOOD-RELATED AUTONOMY AND AGENCY CHANGE WITH AGE BUT ARE INFLUENCED BY SOCIOCULTURAL AND STRUCTURAL FACTORS



Source: Adapted from Glover, D. & Sumberg, J. 2020.[80] Youth and food systems transformation. *Frontiers in Sustainable Food Systems*, 4:101. https://doi.org/10.3389/fsufs.2020.00101. Adapted from Patton, G.C., Sawyer, S.M., Santelli, J.S., Ross, D.A., Afifi, R., Allen, N.B., Arora, M. *et al.* 2016. Our future: a Lancet commission on adolescent health and wellbeing. *The Lancet*, 387(10036): 2423–2478. https://doi.org/10.1016/S0140-6736(16)00579-1, showing the development of autonomy across the life course.

©FAO/EDUARDO SOTERAS
IN KAPOETA, SOUTH SUDAN, YOUNG FARMER LORIKA AMONI STANDS ON HER FARM IN KOROTI, WHERE SHIFTING TO VEGETABLE CULTIVATION AND SHALLOW WELL IRRIGATION HAS BECOME A VITAL STRATEGY FOR COPING WITH WORSENING WEATHER CONDITIONS.

SOCIAL NORMS AND FOOD CHOICES FOR YOUTH

Early relationships with food, shaped largely by parental practices, play a critical role in how youth classify, process and act on food-related information.[86–90] Youth from households where the parents organize the physical and social eating environment and involve their children in decision-making tend to have healthier diets than those from households with strict, parental-dominated parenting styles that limit their child's independence.[91,92] In early adolescence (10–14 years), food choices are largely parent-controlled, shifting toward self-directed choices by middle and late adolescence, when youth form their own eating identities (e.g. healthy, picky, vegetarian).[93, 94] Autonomy over food choices varies, with youth often exercising more control during mornings (e.g. breakfast), weekends or meals outside the home, while parental influence remains strong during family meals and household purchases.[95] Younger youth often perceive food decisions as joint efforts, while parents view them as primarily parental.[96]

Parents, especially those with greater nutrition knowledge, play a key role in guiding their youth toward healthy decisions.[97, 98] In Viet Nam, youth aged 15–17 with greater parental monitoring reported healthier eating behaviours.[99] Similarly, in Peru, youth described how parental guidance emphasized regular meals, adequate intake of fruits, vegetables and dairy, and limited sugar-sweetened beverages to prevent disease. Eating behaviours formed during youth often persisted into adulthood.

Peer relationships also influence food decisions, either reinforcing or challenging social expectations[16] and helping to develop self-regulation.[100] Peers shape dietary intentions and behaviours through social pressure[95, 98] to align with group eating habits.[72] For example, sugar-sweetened beverages and unhealthy foods are often consumed with peers during school breaks.[101] In traditional agrifood systems, such as rural Bangladesh, young people commonly purchase food from street vendors on their way to and from school. Bringing food from home may lead to mockery or exclusion, while sharing street food is seen as way to bond.[102] The effect of peer influence varies by gender, age, self-regulation, type of food and closeness of friendships.[73] Susceptibility to peer pressure decreases with maturity as youth develop a stronger sense of self. Stronger self-regulation is associated with healthier eating habits, such as increased fruit and vegetable intake, while poor self-regulation often leads to junk food consumption and sedentary behaviour.[103, 104]

Household dynamics and cultural norms also shape youth diets.[105] In many rural areas of LMICs, food is closely tied to family and cultural norms. Shared meals dominate and food behaviours align with tradition, such that in households where one-pot meal preparation is common, the entire family's diet may accommodate the health needs of a single member.[106] As youth enter romantic relationships or become parents, they often shift focus from individual to household nutritional needs. The establishment of new dietary habits can lead to unhealthy eating behaviours, though this risk tends to decrease if mutual support for healthy eating is established.[107–110]

Parenthood, particularly for young mothers, brings new challenges by shifting priorities from the self to the child. Cultural beliefs and food taboos may dictate what foods pregnant women should or should not be consuming,[111, 112] and young parents may rely on family members to navigate their new and challenging life roles.[113] In rural areas, youth may take on other caregiving roles, including food preparation for younger siblings while their mothers work.[114] Without careful consideration of the unique challenges faced by rural youth, changes in agrifood systems can exacerbate inequities, further limiting access to affordable, healthy food.

Social norms, beliefs and values related to food – such as body image, self-esteem, environmental considerations and health goals – further guide food decisions among youth,[115] with these influences varying by socioeconomic status[116, 117] and educational attainment.[118] In many cultures, gender norms shape how food is distributed within households. While food allocation has become relatively equitable,[119] females in South Asia and parts of Africa still receive smaller portions and lower-quality nutrient-rich foods, especially in resource-scarce settings.[120, 121] A study of Costa Rican youth found gender stereotypes to be a key determinant of eating habits.[122] Consuming large amounts of unhealthy foods was seen as a sign of masculinity, while eating small portions of healthy foods and focusing on body care were associated with femininity. Parents reinforce these norms, particularly by encouraging daughters to control

their weight. In some cultures, females are more likely to conform to societal expectations around body image, which may lead to disordered eating,[123–125] whereas males are more likely to adopt unhealthy eating behaviours due to social influences,[126, 127] particularly as they grow older, aligned with a decline in self-regulation during this developmental stage.[128–130]

Moreover, economic and social status shape food choices by influencing access and the symbolic value of foods.[131] Youth from wealthier backgrounds often prioritize foods that symbolize social status, including those that are often more accessible and socially acceptable in their circles. Youth from economically disadvantaged households tend to prioritize affordability in their food choices. In contexts with pronounced social class distinctions, these patterns are reinforced, influencing not only what foods are consumed but also how food is perceived and valued.[132-133] Understanding these social influences on youth diet is crucial for developing policies and programmes that promote healthy eating habits and address barriers to nutritious food access (Chapter 7).

NEW INFLUENCES ON YOUTH DIETS

Globalization, modernization and commercial forces associated with agrifood systems transition shape youth diets by exposing them to new foods and ways of eating.[134] Exposure to less nutritious but more affordable and accessible food options, like fast food or vending machines, may compromise diets, especially during developmental years. In urban areas, youth may live independently or with roommates, requiring more autonomous food choices, often prioritizing convenience and cost.[83] In rural settings, youth may continue living with family or partners, commonly sharing food responsibilities with less autonomous choices.[135] Modernization has led to a shift in food-related taboos and traditions, even in rural areas. For example, in pastoralist communities in the United Republic of Tanzania, youth expressed a desire for novel, packaged foods and new recipes, while elders reported frustration with the devaluation of traditional food practices.[134]

Social media and digital platforms play an increasingly important role in shaping youth food choices.[136] Platforms like TikTok, Instagram and Facebook may positively influence youth eating behaviours[137–139] by offering nutrition-related health information, peer support,[101, 137, 140–142] and exposure to global dietary trends like veganism or sustainability initiatives such as reducing food waste. For example, youth in Peru reported using the internet as a credible source for health information.[101] For youth in rural areas, social media can provide access to nutrition education and peer support that is often unavailable locally, though limited food availability can hinder their ability to act on information. However, impressionable youth are particularly vulnerable to false or misleading information, making social media's evolving landscape a potential negative influence on food choices. Advances in technology and the high level of investment in research and development targeting advertising at adolescents and youth have amplified the reach and persuasion of unhealthy food marketing,[143] unrealistic body ideals[137, 141] and extreme eating behaviours (see Box 5.4).[144, 145] While evidence is limited, exposure to digital media appears to increase the consumption of unhealthy foods and drinks in Latin American and Caribbean countries.[146] Youth are particularly vulnerable to tailored marketing of energy-dense, nutrient-poor foods,[147, 148] and many struggle to translate healthy eating intentions into action[147, 149–153] In response, policies are emerging in some contexts to limit food advertisements targeting youth to reduce the negative impact of media on nutritional behaviours.[154–156]

> **AGRIFOOD SYSTEMS TRANSITIONS HAVE IMPROVED DIET AFFORDABILITY BUT STILL FALL SHORT OF ENSURING OPTIMAL NUTRITION FOR YOUTH.**

BOX 5.4 BODY IDEALS INFLUENCE DISORDERED EATING BEHAVIOURS GLOBALLY

Youth and early adulthood mark a period of increased vulnerability to disordered eating in both high- and low-income countries. Although traditionally associated with Western countries, the idealization of thinness as a beauty standard has spread globally through media exposure.[i, ii] Increased media consumption has contributed to the growing preference for thin body sizes among females and muscular physiques among males, generating body dissatisfaction, even in less globally acculturated communities such as rural Nicaragua.[iii]

In Africa, larger body sizes for females have traditionally symbolized dignity, health, beauty and wealth,[iv] whereas thinner body sizes have been preferred for males.[v] With globalization and media influences, these ideals are shifting towards Western standards.[vi, vii] In Ghana, this shift has led youth to engage in dieting behaviours to achieve the thinner bodies portrayed in the media,[viii] where foods and beverages advertisements often feature underweight actors.[ii] Studies have linked disordered eating to body shape dissatisfaction in Ethiopia,[viii] higher BMI Z-scores in Denmark[ix] and perceived social norms in Fiji.[x] Eating disorders have also been observed among college students in South India[xi] and are three times more common among college students in Lebanon and Qatar than in the United States of America.[xii] Family attitudes toward weight, peer pressure, sociocultural norms and perceptions of attractiveness all influence eating behaviours and body concerns.[i]

Notes: Refer to the **Notes section** for full citations.

Economic disparities directly affect youth's dietary decisions.[157, 158] Parental education, household income and family structure all influence youths' ability to achieve financial independence and secure adequate nutrition.[159, 160] Youth with educated parents or stable family incomes are often more financially secure,[82] enabling them to access and afford healthier diets. Conversely, those from lower-income families may be forced to prioritize energy-dense, cheaper foods that compromise their long-term health.[161–163] Migrant youth, especially those from LMICs, often face food insecurity due to unfamiliar food environments, limited financial resources or economic pressures.[58–60] The challenges are compounded for rural youth due to economic, geographical and historical barriers, including geographic isolation and limited access to diverse, nutritious foods. Indigenous youth experience additional challenges rooted in historical marginalization, cultural erosion and reliance on nutrient-poor processed foods.[164–66]

Youth food choices and nutritional outcomes are closely tied to the transition point of the agrifood system in which they live.[167, 168] Agrifood systems range from protracted crisis and traditional to highly modernized industrial systems, and determine the availability, affordability and quality of food.[167, 169] Evidence indicates that transitions in agrifood systems have made recommended diets more affordable, but that they also fall short of ensuring optimal nutrition and health outcomes for youth irrespective of the stage of transition.[167] In traditional agrifood systems, youth food choices are constrained by restricted market access and a heavy reliance on staple crops, leading to poor dietary diversity and common micronutrient deficiencies, particularly among adolescent girls and caregivers.[170, 171, 172] As agrifood systems transition – including expanding, diversifying and formalizing agrifood systems – growing market access and an influx of processed foods can diversify diets but also pose risks of both undernutrition and overweight, contributing to a double burden of malnutrition.[173, 174] In industrialized systems, youth are embedded in highly commercialized and media-saturated food environments, where food abundance and variety are often greater. Navigating these environments to make healthy choices can be challenging, especially within landscapes dominated by aggressive marketing of unhealthy options. Equitable access to healthy options can also remain elusive, especially for youth from lower socioeconomic groups,

contributing to a rise in obesity and non-communicable diseases.[167, 175] Characteristics of these agrifood system typologies often coexist within countries, particularly in low- and middle-income countries, leading to fragmented food environments.[175] For rural and marginalized youth, the benefits of agrifood systems transition are not always equitably distributed, and their nutritional vulnerabilities may persist or intensify.[176–179] Unlike urban areas, access to healthy and diverse food is more limited in rural areas.[180] Rural families often purchase food in bulk or from small convenience-type stores with a limited range of food items, in order to avoid long trips to the grocery store. Such habits limit youth exposure to fresh foods and increase their reliance on ultra- processed, nonperishable and often unhealthy foods.[171, 172] Addressing these divergent realities requires integrated policy approaches that consider not only food availability, but also the intersection of cultural norms, market forces and socioeconomic inequalities that shape youth food choices and nutritional outcomes.[169, 170, 175, 181]

> **ENABLING HEALTHY DIETS REQUIRES AGRIFOOD SYSTEMS TRANSFORMATION THAT REFLECTS YOUTH NEEDS, VALUES AND ECONOMIC CONTEXT.**

Food security and nutrition are critical to both the individual well-being and broader economic development of youth. As agrifood systems transform, they shape not only what youth eat but also how they learn, work and thrive. When well-nourished, youth are better equipped to succeed in school, enter the workforce, and contribute meaningfully to agrifood systems transformation and society at large. As active participants in reshaping agrifood systems, youth hold the potential to drive positive change (see Box 5.5). To effectively deliver on its promise of improved food security and nutrition for youth, agrifood systems transformation must align with young people's biological and dietary needs, sociocultural values and aspirations, and economic realities. Thoughtful agrifood systems transformation, involving youth as active co-creative agents in the transformation process, is necessary to enable healthy diets for all.

©FAO/EDUARDO SOTERAS
IN THIKA, KENYA, A YOUNG AGRIPRENEUR SLICES A WATERMELON AT HIS MARKET STALL, PART OF A NEW WAVE OF YOUTH-LED VENTURES ENERGIZING LOCAL AGRIFOOD MARKETS.

BOX 5.5 YOUTH ENGAGEMENT IN AGRIFOOD SYSTEMS TRANSFORMATION FOR FOOD SECURITY AND NUTRITION

Youth play a pivotal role in agrifood systems transformation by introducing innovative practices, advocating for sustainable changes and facilitating economic growth. Their engagement enhances food production, improves access to healthy foods and strengthens food security at both local and national levels.

Uganda's *Young Farmers' Federation* has trained over 35 000 farmers in profitable farming, value addition and sustainable practices. Programmes like the International Young Farmers' Exchange[i] expose youth to climate-smart techniques and improved post-harvest handling, reducing food loss and ensuring year-round access to healthy food. The federation links young farmers to financial services, helping them transition from subsistence to agribusiness. Access to modern technologies enhances productivity and minimizes food loss during droughts or economic shocks. Professionalizing farming increases their income and ability to buy nutrient-dense foods.[ii]

Brazil's *Elixir Foods Initiative* is a youth-led startup that transforms cocoa pod waste into a high-value sweetener, providing an innovative model for wealth creation through circular economies. By stabilizing cocoa honey, a previously discarded byproduct, using solar energy and digital sensors, the initiative reduces food waste and increases the availability of less processed sweeteners. New revenue streams for smallholder farmers increase their financial ability to purchase healthy foods.[ii,iii]

Malawi's *New Achikumbe Elite* are educated urban-based youth engaged in commercial agriculture. These young entrepreneurs use digital platforms to access market information, agricultural training and financial services, overcoming traditional barriers to entry. Their focus on high-value, nutrient-rich crops such as legumes and vegetables contributes to diversified diets and improved food availability. Moving beyond subsistence farming helps them to reduce seasonal food shortages, improve household nutrition and enhance agrifood systems resilience. Their success creates employment opportunities, breaking intergenerational cycles of poverty and promoting long-term food security.[iv]

To enhance food security and nutrition, policies must expand youth access to financial services, business mentorship and market connections. Investing in youth entrepreneurship, cooperatives and value-chain development increases the availability of diverse and nutrient-rich foods, strengthens local production and builds economic resilience. Strengthening youth engagement in agrifood systems is critical for creating more equitable, sustainable and food-secure communities.[v]

Notes: Refer to the **Notes section** for full citations.

©FAO/FAO/HEBA KHAMIS
IN BANGAR EL SOKOR, EGYPT, MOHAMED ATTIA, LOADS TOMATOES TO THE WHOLESALER TRUCK.

06
VULNERABILITY AND RESILIENCE OF YOUTH IN AGRIFOOD SYSTEMS

©VISIONTIME/MELANIE BOUTROS
IN RAS SIDR, EGYPT, AKRAM BADR, A YOUNG COOPERATIVE FARMER STRUGGLES WITH WATER SCARCITY ON HIS PLOT OF LAND IN THE BASAYSA YOUTH COOPERATIVE.

KEY MESSAGES

- Agrifood systems are generally less prone to job losses than other sectors during economic downturns. However, youth are more likely to lose their jobs in agrifood systems during economic downturns than adults, and young women are more likely to lose their jobs than young men.
- The downturn due to the COVID-19 pandemic was particularly detrimental to young women's employment in agrifood systems. While adult employment in agrifood systems increased by 3 percent, youth employment declined by 2 percent, driven by a 7 percent reduction in employment among young women.
- Weather shocks in rural areas have different impacts on youth and adult employment in terms of if, where and how much they work. There are also important differences between their impacts on young men and young women.
- Heat stress is associated with an increase in the likelihood of youth working, and a decreased likelihood among adults. Youth increase their weekly working times by two hours more per week, compared to one hour more for adults. This effect is driven by young men, while young women tend to work less.
- Floods increase young women's likelihood of working, while older adults and young men work relatively less. Young female workers exposed to floods also work longer hours and are more likely to work in agriculture, while young male workers are more likely to be employed in other sectors.
- Young women tend to be more adversely affected by climate stress than young men in terms of human capital formation. In addition, climate stress makes young women more likely to marry early and have children at a younger age, compared with young men. These factors, in turn, shape their labour market opportunities.
- Youth have higher levels of subjective resilience than adults in protracted crises contexts. Despite the hardships they face, they maintain a positive view of their ability to cope with these challenges and create conditions for a better future.
- In the context of conflicts, young women assume a larger work burden in agriculture, sustaining production by working more and longer hours in agriculture activities.

INTRODUCTION

The ability of youth to participate in and contribute to the transformation of agrifood systems requires successful navigation of the challenges posed by an increasingly volatile and uncertain world. The escalating frequency and intensity of economic crises, extreme climatic events and conflicts exacerbate the livelihood challenges youth face and inhibit agrifood systems transformation. Building the resilience of youth is, therefore, fundamental for enhancing their wellbeing and, more broadly, facilitating and sustaining the transformation of agrifood systems.

Resilience is a concept with many definitions and applications.[1] Yet, at its core, it is the "capacity that ensures shocks and stresses do not have long-lasting adverse development consequences", where capacity is understood to include economic, political, social and psychological capacities.[1] In practice, resilience implies the ability of individuals, households and broader systems to adapt, absorb and transform in the face of shocks and stresses.[2]

Resilience is both an ability and set of capacities – including material, institutional and psychological capacities – that explain why some households and communities fare better in the face of shocks than others. Resilience is shaped by the ability to access and control key resources and services needed to mitigate the impacts of shocks, to recover from them and to make proactive choices to reduce their future impact; it entails having access to adequate and appropriate information and other services to make informed decisions and take actions; and it involves having the psychological resources and agency needed to withstand, adapt and transform one's livelihood in the face of risks and uncertainties.[1, 3, 4]

Youth-specific constraints, including a lack of skills and experience, limited assets, less social and political agency (Chapter 3), and a disproportionate reliance on precarious and informal work (Chapter 4), can make youth particularly vulnerable to welfare losses in the face of external shocks and stressors. These challenges are magnified for young women, Indigenous youth, persons with disabilities and those from minority identities, who are often more vulnerable to shocks due to formal policies and informal social norms that limit access to the resources, opportunities and decision-making spaces they need.[5, 6]

Yet, youth also possess important attributes that, if effectively supported, enable them to effectively withstand the adverse effects of shocks and stressors on their livelihoods. Familiarity with digital technologies, higher levels of education and a willingness to migrate in search of better opportunities (Chapter 2) can help youth to access needed information and employment. Leveraging these attributes and overcoming youth-specific challenges is key for building their resilience.

This chapter sheds light on the experiences of youth in the face of mounting shocks and stresses in agrifood systems. It focuses specifically on the ways in which exposure to economic downturns, climate stresses, and conflicts and protracted crises affect the lives and livelihoods of youth in agrifood systems, and how these experiences differ between young men and women. It explores how youth's vulnerability to these events is different from those of adults, and how they adapt, absorb and respond to these situations. Additionally, the chapter will highlight how the specific strengths and abilities of youth can contribute to mitigating the impacts of shocks for themselves and their communities.

YOUTH RESILIENCE AND VULNERABILITY TO GLOBAL ECONOMIC DOWNTURNS

Economic downturns have a disproportionate impact on young people, and their vulnerability to these shocks is increasing as a result of broader shifts in global labour markets.[7] Youth in agrifood systems often have fewer skills, less formal work arrangements and less work experience to draw on in times of economic crisis (Chapters 3 and 4). As a result, when labour markets in agrifood systems and other sectors contract, youth are more likely than adults to lose their jobs, and subsequently face greater difficulties in finding new employment, as employers are prioritizing employee retention over new recruitment.[8–10] At the same time, structural shifts in the global labour market are resulting in higher levels of job insecurity for youth. As labour arrangements become increasingly flexible, informal and precarious, youth have fewer protections against job and livelihood losses during economic downturns.[11]

During the 2007/08 Great Recession, global youth labour force participation rates across all sectors fell by more than 9 percentage points, compared to a drop of 2 percentage points among adults.[12] Similarly, during the COVID-19 pandemic, global youth employment dropped by 5.4 percentage points compared to just 1.5 percentage points among adults.[13] Young people not in employment, education or training (NEET) accounted for approximately half of the youth employment losses during the COVID-19 crisis.[9] Youth in this category are particularly vulnerable to prolonged detachment from the labour market, with adverse effects on their future wages, lifetime earnings and probability of future unemployment.[14] Youth unemployment in times of crisis also has distinctive gender dimensions. For example, young women are twice as likely to fall into the NEET category than young men and are much less likely to transition out of it.[13]

The effects of economic downturns on youth employment can shape the long-term socioeconomic trajectory of their lives. For example, they can disrupt other key life cycle events, such as marriage, parenthood or home ownership.[15–17] They can also undermine the development of human capital and the accumulation of social networks derived from employment, thereby affecting young people's future labour market attainment.[7, 18] Finally, they can undermine the development of youth's sense of self and social identity, and their ability to achieve economic autonomy.[19,20] The accumulation of these adverse impacts reverberates throughout society, affecting national, regional and global economic development trajectories, social integration and political stability.

Yet, agrifood systems are unique compared to other economic sectors and are not necessarily affected by economic downturns in the same way. Indeed, in many places agrifood systems have historically provided a livelihood refuge for people in times of economic crisis and job loss, absorbing workers displaced in other sectors of the economy.[21] This is particularly true in traditional agrifood systems where a large share of the population is engaged in primary agriculture production, which can absorb many displaced workers.[22]

Of course, each economic crisis is distinct. The 2007/08 Great Recession was associated with a rapid spike in global food prices, which had profound effects on global food security, but also sparked a wave of new private and public investment in the agriculture sector after decades of neglect.[23] The renewed focus on agriculture generated by the Great Recession likely contributed to the creation of new work opportunities in the sector, despite contractions in other sectors.[24, 25] Conversely, while mobility restrictions to contain the spread of

COVID-19 often exempted agricultural production, they substantially disrupted work in non-farm segments of agrifood systems, including food retail, trade and input production,[26] while also increasing agrifood system workers' risk of being exposed to the virus.[27] For these reasons, it is likely that the work opportunities in agrifood systems varied substantially between these two major crises.

Employment data from the International Labour Organization (ILO) demonstrate how changes in agrifood system employment rates differ between youth (aged 15–24 years) and adults (aged 25–54 years) during the global recession of 2007/08 and the COVID-19 pandemic, with further variation between women and men.[e, f]

THE GREAT RECESSION AND YOUTH EMPLOYMENT IN AGRIFOOD SYSTEMS

While global employment declined during the Great Recession of 2007/08,[12] the data indicate a moderate increase in agrifood system employment, suggesting that the sector was more resilient to the shock than other sectors. Yet, important differences exist between age cohorts. As shown in Figure 6.1, total employment in agrifood systems increased marginally more for adults (3 percent) than for youth (2 percent) between 2007 and 2009, and the age differences are more pronounced when employment is disaggregated by segments of the agrifood system. In agricultural employment, which includes self-employment in agricultural production and paid employment, adult employment increased by 5 percent compared to just

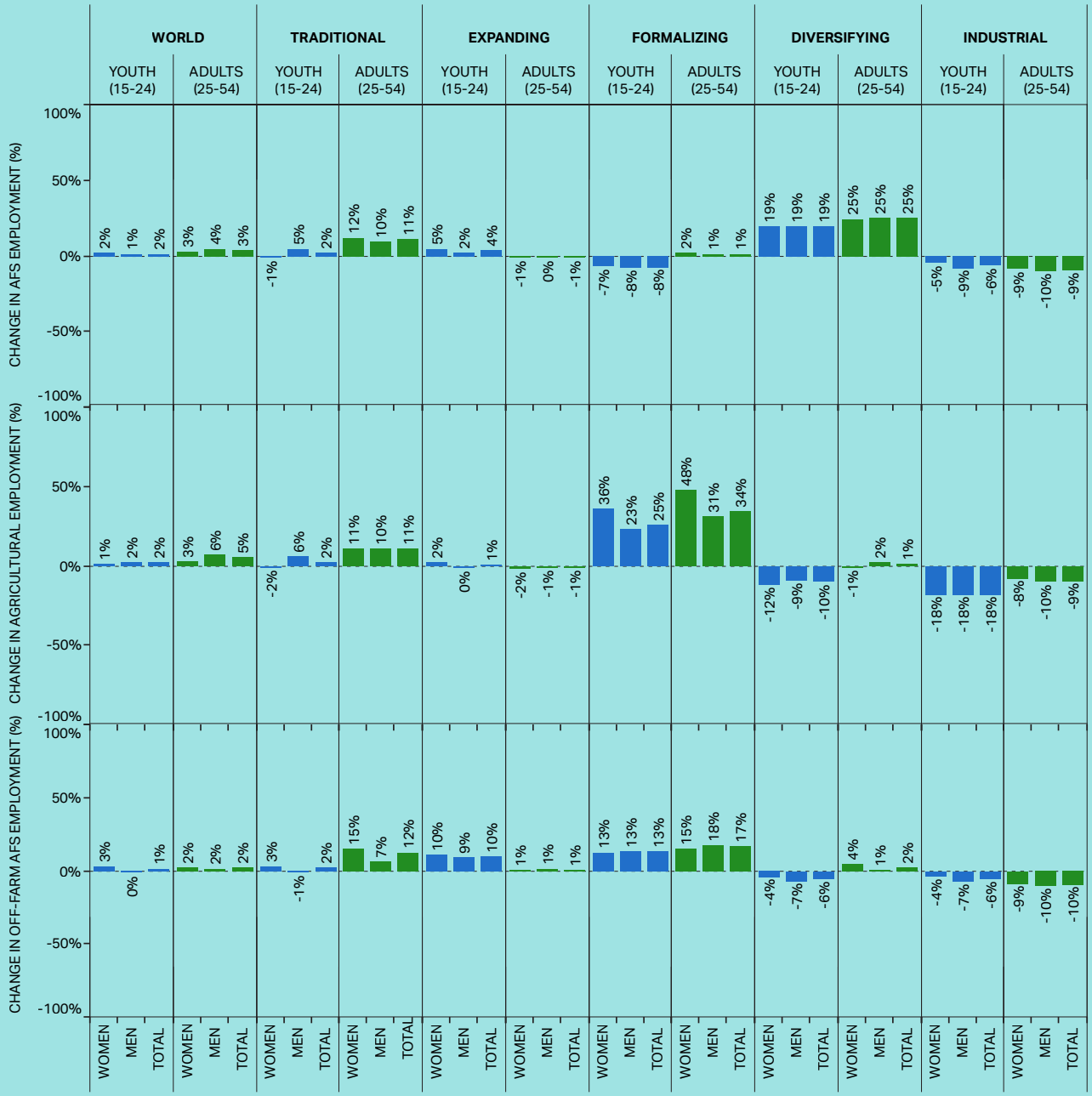
e The ILO applies the 13th ICLS definition of employment to ensure cross-year comparability and processes household and labour force surveys to estimate employment by sex, age and economic activity. Data are classified using either ISIC Rev.4 or ISIC Rev.3.1, depending on the survey year. Agrifood systems are defined as per Davis *et al.* (2023).[28] See **Box 4.1** for more details.

f For the 2007/08 Great Recession, data from 30 countries are used to compare employment rates in 2007 to 2009 across different agrifood system categories. For the COVID-19 crisis, from 45 countries are used to compare the period 2019–2020.

©VISIONTIME/JAVED PATEL IN NORTHERN GHANA, A YOUNG WOMAN STANDS AT THE EDGE OF A FIELD, WATCHING AS AN OLDER FARMER HARVESTS CROPS FOR MARKET. DURING THE GREAT RECESSION, AGRIFOOD SYSTEMS PROVED MORE RESILIENT THAN OTHER SECTORS, YET YOUTH LIKE HER OFTEN FACED BARRIERS TO FULLY PARTICIPATING, FROM LIMITED ACCESS TO LAND TO FEWER SOCIAL AND FINANCIAL RESOURCES.

FIGURE 6.1

ADULT EMPLOYMENT IN AGRIFOOD SYSTEMS INCREASED MORE THAN YOUTH EMPLOYMENT DURING THE GREAT RECESSION OF 2007/08



Note: Traditional: Cambodia, Tajikistan. *Expanding*: Bolivia (Plurinational State of), Honduras, Peru, Viet Nam. *Diversifying*: Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, Panama, South Africa. *Formalizing*: Albania, Brazil, Costa Rica, Cyprus, Dominican Republic, North Macedonia, Portugal, Slovakia, Türkiye Venezuela (Bolivarian Republic of). *Industrial*: Australia, Austria, France, Greece, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

2 percent among youth. For off-farm segments of the agrifood system, the increase was more modest, with adult employment increasing by 2 percent compared to 1 percent in youth employment, driven mostly by off-farm employment gains by young women.

Variance in employment outcomes between adults and youth likely reflect differences in their ability to access key resources, as well as variations in employment tenure, skills and social networks needed to acquire and sustain employment in the agrifood system. Given that the largest difference is found for agricultural employment, it is likely that youth employment was constrained by greater limitations on access to land and productive agricultural resources required to transition to agricultural self-employment during the crisis.

However, the average employment gains in agrifood systems seen were not distributed equally across the different agrifood system typologies. As shown in Figure 6.1, employment increases were concentrated in countries with less formalized and industrialized agrifood systems, with particularly high gains in countries with diversifying agrifood systems. In most cases, these gains were also greater for adults than youth. In traditional agrifood systems, for example, agrifood system employment increased by 11 percent for adults compared to only 2 percent for youth. Only in expanding food systems did youth employment increase more than for adults driven, primarily by employment growth in the non-farm segments of agrifood systems.

The concentration of employment growth in less formalized and industrialized food systems during the Great Recession of 2007/08 was likely driven by differences in agrifood system structure. In less formalized agrifood systems, employment in agrifood systems makes up a substantially larger share of total employment than in more formalized and industrialized systems and consists of many small-scale primary producers and self-employed non-farm workers. Barriers to entry into agrifood system employment are generally lower in countries with less developed agrifood systems than in more formalized and industrial agrifood systems. This is why, when employment opportunities in other sectors contract due to broader economic downturns, self-employment in agrifood systems provide a livelihood option in less developed agrifood systems.

There are also important differences in employment outcomes between young women and men. Across all 30 countries, young women's employment in agrifood systems increased by 2 percent compared to 1 percent among young men. The higher employment gains for young women were driven by employment growth in the non-farm segments of the agrifood system, such as food retailing, processing and trading. On average, across all 30 countries young women's employment increased by 3 percent in non-farm segments of agrifood systems, compared to no change for young men. These gains are concentrated in lower income countries with less formalized agrifood systems. This difference between young men and women likely reflects the gendered division of labour within agrifood systems, with women's labour generally concentrated in non-farm agrifood system work, particularly in countries with lower levels of economic development (Chapter 4). However, this work is often embedded in less profitable value chains and under worse terms than men, due to persistent discriminatory gender norms and lower access to assets and resources.[29]

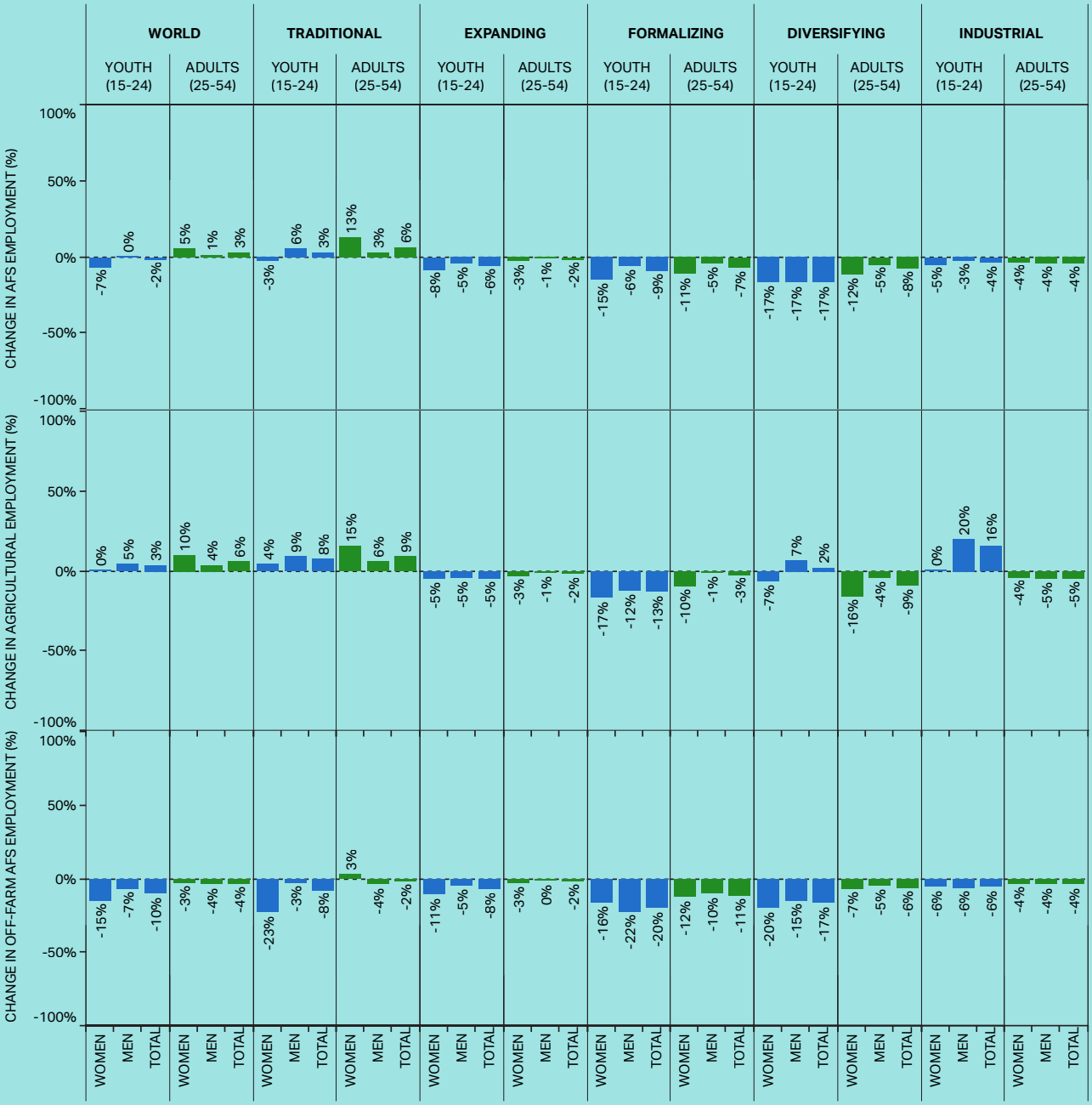
> "ECONOMIC DOWNTURNS SHAPE THE LONG-TERM SOCIOECONOMIC TRAJECTORY OF YOUNG PEOPLE'S LIVES.

THE COVID-19 CRISIS AND YOUTH EMPLOYMENT IN AGRIFOOD SYSTEMS

In economic terms, the COVID-19 crisis differed significantly from the Great Recession. Efforts to curtail the spread of the virus in numerous countries entailed restrictions on people's mobility and led to the closure of many "non-essential" businesses. These closures profoundly affected people working in informal jobs and in positions for which teleworking options were not available.[16, 30] While agriculture was considered an essential industry, mobility restrictions and the closure of retail food markets upended agriculture supply chains and led to a contraction of many non-farm employment opportunities in agrifood systems.[31, 32]

FIGURE 6.2

REDUCTIONS IN YOUTH EMPLOYMENT IN AGRIFOOD SYSTEMS DURING THE COVID-19 CRISIS WERE DRIVEN BY LOSS OF OFF-FARM WORK AMONG YOUNG WOMEN



Note: Traditional: Cambodia, India, Myanmar, Zambia. *Expanding*: Bolivia (Plurinational State of), Botswana, Egypt, El Salvador, Georgia, Honduras, Kyrgyzstan, Peru, Sri Lanka, Thailand, Vanuatu, Viet Nam. *Diversifying*: Armenia, Bosnia and Herzegovina, Ecuador, Iran (Islamic Republic of), Mauritius, Mexico, South Africa, Trinidad and Tobago. *Formalizing*; Argentina, Belarus, Costa Rica, Cyprus, Dominican Republic, Jordan, Mongolia, North Macedonia, Portugal, Slovakia, Türkiye. *Industrial*: Australia, Austria, Czechia, France, Greece, Israel, Italy, Japan, Switzerland, United Kingdom of Great Britain and Northern Ireland.

Source: Author's own elaboration based on ILO Harmonized Microdata, https://ilostat.ilo.org

As with the Great Recession, the COVID-19 crisis produced very different employment outcomes for adults in agrifood systems compared to youth. As Figure 6.2 shows, total youth employment in agrifood systems declined by 2 percent between 2019 and 2020 in the 45 countries considered in this analysis, compared to a 3 percent increase for adults. As detailed below, these findings were driven mostly by decreased employment for young women. Employment growth in agrifood systems during the pandemic only occurred in countries with traditional agrifood systems. In all other agrifood systems employment declined, with greater employment losses for youth than for adults.

Traditional agrifood systems are characterized by a large share of total employment engaged in agrifood system work, mostly through small-scale primary production, informal agricultural labour and self-employed non-farm agrifood system work. In this context, the agrifood system sector was capable of absorbing labour from other sectors that shed labour during the COVID-19 crisis.

During the pandemic, trends in agricultural work remained on average positive, increasing by 3 percent for youth and 6 percent for adults, while work in the off-farm segments of agrifood systems experienced sharp declines of 10 percent for youth and 4 percent for adults. These results are consistent with findings from 40 low- and middle-income countries, which showed that during the COVID-19 crisis agriculture absorbed workers who lost jobs in the services, industry and public service sectors.[16]

Important gender differences exist in terms of the impact of the crisis on employment. Agrifood system employment remained unchanged for young men but declined by 7 percent for young women. In agriculture, specifically, young men's employment increased by 5 percent, while young women's employment remained on average unchanged. Losses for young women, though, were high in non-farm segments of the agrifood system at 15 percent compared to 7 percent for young men.

"YOUTH AGRIFOOD SYSTEM EMPLOYMENT DECLINED DURING THE COVID-19 PANDEMIC.

The substantial reduction in young women's employment in agrifood systems reflects various societal factors that make young women more vulnerable to the effects of economic crises than young men. Young women often work in more precarious forms of employment, including self-employment in non-farm agrifood systems work (Chapter 4). These jobs are often particularly sensitive to mobility restrictions and restrictions on public gathering.[29] For example, work in petty trading and food retailing, which employ large numbers of young women in traditional agrifood systems, were heavily disrupted by containment policies during the pandemic.[32] This is reflected in the employment data, where young women's non-farm agrifood system employment declined by 23 percent in traditional food systems – the largest decline of any group.

The pandemic also had very specific impacts on women's unpaid work. School closures and disruptions in services affected women more than men, increasing the ratio of unpaid work between women and men from 1.8 hours in 2020 to 2.4 hours in 2021.[33] The increase in the unpaid care burden for women during the pandemic forced many women to forgo work altogether or to reduce their working hours.

CLIMATE STRESSES AND YOUTH IN AGRIFOOD SYSTEMS

Climate change plays a fundamental role in shaping the livelihoods of youth and their economic and social transition into adulthood. The challenges posed by climate change are particularly acute for rural people who depend on agrifood systems for their livelihoods. For example, climate change gives rise to significant transformations in agroecological conditions, leading to shifts in the types of agricultural systems and associated value chains that are feasible. As a result, people in agrifood systems are increasingly forced to make radical changes in their livelihoods and in some cases pushed to migrate in search of new opportunities.[34–37] These challenges are important for all people but are particularly pronounced for young people who are transitioning to adulthood. Moreover, youth today will experience continued and accelerated changes in the climate during their lifetimes. How young people in agrifood systems navigate the constraints and uncertainty imposed by climate change will determine both their individual well-being and the future trajectory of development for countries and regions across the world.

In the face of climate change, young people in agrifood systems will need to be resilient and adaptable to successfully transition into adulthood. However, youth in agrifood systems often possess important positive attributes that may help to strengthen both their climate adaptability and resilience. For example, young people tend to have higher levels of education compared to their parent generation and are better able to leverage digital technologies to access information (Chapter 3). These factors may enable youth to access a larger range of employment options, including work outside of primary agricultural production, and to obtain information required to adapt to climate change. Moreover, there is evidence that young people are more open to innovation and change, which increases their willingness to explore different jobs, learn new skills and experiment with advanced technologies. For example, studies show that young farmers are more likely to adopt drought-tolerant seed varieties than older people[38] and to migrate in search of non-farm jobs.[39] Finally, young people are biologically better able than older adults to handle extreme weather events such as heat stress, when engaging in high-intensity physical work, which is required for many agrifood system jobs.

Young women, however, often face a range of structural constraints due to discriminatory gender norms that limit their capacity to respond to climate-related challenges. For example, young women have on average lower levels of education, less economic and political agency to act, and more limited access to information needed to respond to climate change.[40–43] They also often work in jobs that are flexible, part-time or home-based, but poorly paid, because of the disproportionate role they play in unpaid household work.[29, 44] In addition to these socioeconomic factors, women's physiological heat resistance is generally lower than that of men due to a higher percentage of body fat, lower aerobic fitness and lower sweat rates.[45]

Climate change creates substantial challenges to youth's human capital formation, which can undermine their future well-being and the pathways available to them as they transition into adulthood. For example, exposure

to extreme weather events has been found to impede learning among secondary students and university applicants from low- and middle-income countries. Studies show that students who experience extreme heat, floods and tropical storms concurrent with exams perform significantly worse than those who learn under normal conditions.[46–50] Extreme weather events can also push young people out of school and into the workforce. For example, in Madagascar, both droughts and cyclones reduce the likelihood of adolescents and young adults in rural areas attending school, while increasing their propensity to work.[51] In Mexico, similar effects are found for hurricanes and floods.[52]

There are also important gendered differences in the impacts of climate stresses on educational decisions and outcomes. In Mexico, for example, the education outcomes of girls and young women are more negatively affected by natural disasters (including hurricanes and floods) than those of boys and young men.[51,52] Conversely, in India negative rainfall shocks are associated with better education outcomes, particularly for girls, because of the adverse effects of these events on wages. Interestingly, this effect is stronger in districts with higher female labour force participation in agriculture (i.e. where young womens' farm labour is more valuable and the opportunity costs of their education are higher).[53]

Climate change and associated extreme weather events also affect the timing of young women's life transition (e.g. through decisions related to marriage and pregnancy). In sub-Saharan Africa, exposure to extreme weather events has been linked to earlier marriages and first pregnancies.[54–56] Early marriage is also associated with premature childbearing and early termination of education of women, with long-term consequences for their economic and social development. Furthermore, women who marry early are often considerably younger than their husbands, which is found to undermine their intra-household bargaining power.[57] Women's involvement in household decision-making matters for their vulnerability to climate change, as it determines their crop choices for the household farm, as well as their likelihood to engage in non-agricultural activities.[40]

"YOUNG WOMEN FACE STRUCTURAL BARRIERS THAT LIMIT THEIR ABILITY TO RESPOND TO THE CHALLENGES OF CLIMATE CHANGE.

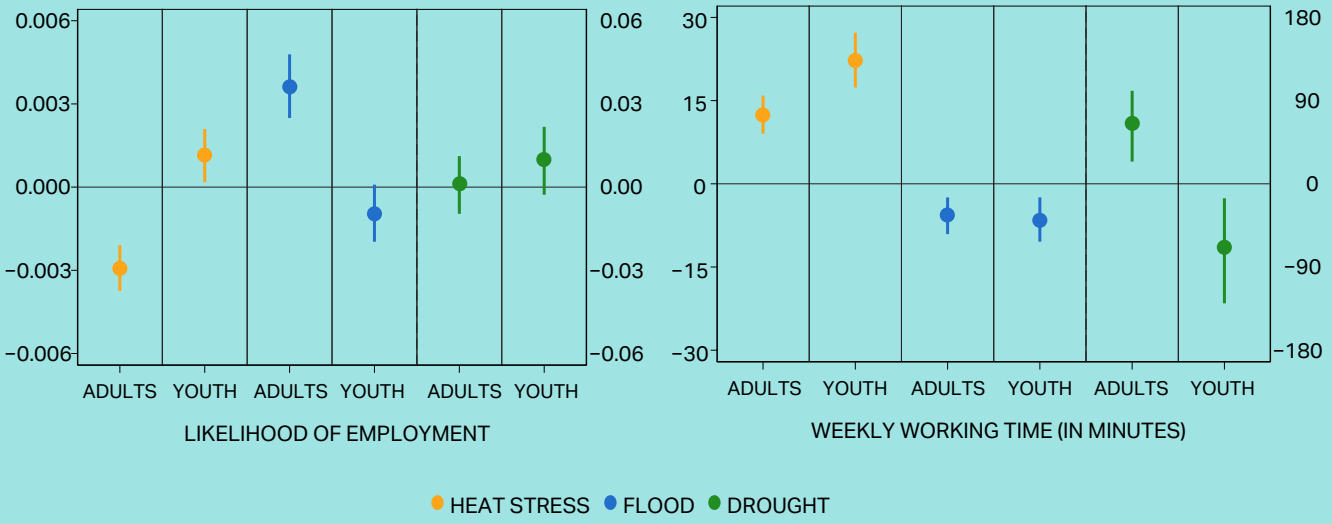
However, there is little evidence on the implications of climate stresses on labour market outcomes for young people in agrifood systems, and how these differ between women and men. Understanding the relationships between climate stresses and labour opportunities and decisions is critical to gain insights into the broader consequences of the increasingly uncertain global climate on youth's transition to adulthood. The next section provides analysis from six countries and more than 55 000 individual observations to fill this gap.[g,h]

g Six countries in sub-Saharan Africa (Ethiopia, Malawi, the Niger, Nigeria, Uganda and the United Republic of Tanzania) are included with more than 55 000 individual observations, merged with geo-referenced temperature and precipitation data. The analysis builds on recent work by FAO[37] and explores how different types of extreme weather events affect youth's (age 15—24) labour market decisions in agrifood systems, how these compare with adults (age 25—65) and how they differ between young men and women.

h A similar analysis of individual-level labour outcomes was conducted for FAO's recent report *The Unjust Climate*.[37] However, that report yields different results for exposure to heat stress finding an increased likelihood to work among older people and no change for youth. This discrepancy is due to variations in the definition of the variable capturing heat exposure. Given that *The Unjust Climate* report focuses on primary agricultural production, the variable accounts for seasonality differences in heat exposure. For the present study, which looks at agrifood systems in more general terms, the authors opted for a broader definition.

FIGURE 6.3

WEATHER SHOCKS AFFECT RURAL YOUTH EMPLOYMENT DIFFERENTLY FROM ADULT EMPLOYMENT



Notes: The left panel considers all individuals while the right panel considers only those who work (defined as having worked for at least one hour in the week of reference, including work performed on the household farm or in a family business). The effects of heat stress and floods are measured for one additional day of exposure to the respective shock and plotted on the left-hand axis. The effect of droughts refers to whether a drought occurred in the year before the survey and is plotted on the right-hand axis. Effects are statistically significant if the whisker bars representing 90-percent confidence intervals do not cross the zero line.

Source: Kluth, J. Rossi, J.M. & Sitko, N. Forthcoming. *Climate shocks and youth labour: Gender-disaggregated evidence from SSA*. ESP working paper series. Rome, FAO

COMPARING LABOUR OUTCOMES BETWEEN YOUTH AND ADULTS WHEN EXTREME WEATHER EVENTS OCCUR

Exposure to heat stress in rural areas is associated with an increase in young people's likelihood of working, while older people are less likely to work on average. Yet, for young and older workers who continue to work during these events their weekly working hours increase. In an average year, these effects translate into about an hour of additional work per week for adults and almost two hours per week for youth. As discussed below, this increase in work is driven particularly by an increase in work among young men.

Floods have the opposite effects, making youth relatively less likely to work than adults. Moreover, the results show a small decrease in weekly working hours among the entire working population. This may be driven by the loss of work opportunities in rural areas, such as employment on farms, upon which rural youth often rely.

Exposure to droughts is not related to the likelihood of working. However, droughts are associated with an increase in the weekly working hours of adults of about one hour. For youth, in contrast, the results point to a decrease in working hours of more than one hour. As with floods, this evidence suggests that the working opportunities of rural youth are more sensitive to drought than those of older people.

EXPLORING LABOUR DIFFERENCES BETWEEN YOUNG MEN AND WOMEN DURING EXTREME WEATHER EVENTS

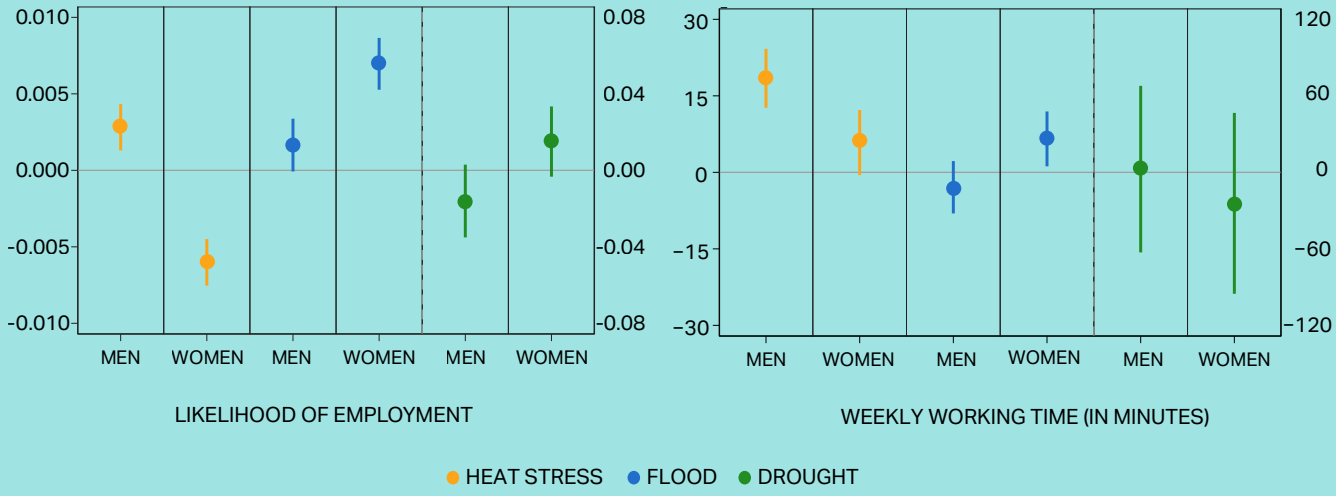
There are important differences in working opportunities between young women and men who experience extreme weather events. When exposed to heat stress, young women are less likely to work, both overall and compared to their male peers (see Figure 6.4). In other words, the higher likelihood of youth working in response to heat, discussed above, is driven by young men. In addition, working hours increase among young men but not among young women. Similar findings from South Africa have been at least partially explained by men's higher physiological resistance to heat.[58] Moreover, young women's reduced engagement in work may be linked to an increase in their household work burden caused by heat stress, for example, fetching water. Young women are also likely to be more involved in caring for children and elderly dependents, whose health is relatively more susceptible to heat.[59–61]

In contrast to heat stress, exposure to floods and droughts is associated with an increase in young women's likelihood of working and a small increase in labour time relative to that of young men. For droughts, studies from Madagascar and Uganda have produced similar results.[51, 62] However, studies from Latin America and India find floods to be related to a stronger increase in the likelihood of employment among young men than among young women.[52, 63, 64] Droughts, on the other hand, are related with a decreased likelihood of employment, with larger effects among women detected in Mexico.[52,65] These discrepancies might arise due to regional differences in gender norms. In fact, women's role in the labour market is more pronounced in sub-Saharan Africa than in other regions of the world, with female labour force participation standing at 62 percent, compared to 29 percent in South Asia and 57 percent in Latin America.[66]

©FAO/ANASTASIIA BORODAIENKO
IN LVIVSKA OBLAST, UKRAINE, A YOUNG CHEESEMAKER KEEPS HER SHEEP FARM RUNNING DESPITE WAR-RELATED CHALLENGES, SHOWING STRENGTH AND RESILIENCE IN THE FACE OF ADVERSITY.

FIGURE 6.4

RURAL YOUNG MEN WORK LONGER HOURS DURING HEAT STRESS, WHILE YOUNG WOMEN WORK MORE DURING FLOODS



Notes: The left panel considers all young people while the right panel considers only those who work (defined as having worked for at least one hour in the week of reference, including work performed on the household farm or in a family business). The effects of heat stress and floods are measured for one additional day of exposure to the respective shock and plotted on the left-hand axis. The effect of droughts refers to whether a drought occurred in the year before the survey and is plotted on the right-hand axis. Effects are statistically significant if the whisker bars representing 90-percent confidence intervals do not cross the zero line.

Source: Kluth, J. Rossi, J.M. & Sitko, N. Forthcoming. *Climate shocks and youth labour: Gender-disaggregated evidence from SSA*. ESP working paper series. Rome, FAO

“HEAT STRESSES PUSH YOUNG PEOPLE, PARTICULARLY YOUNG WOMEN, OUT OF AGRICULTURE AND INTO EMPLOYMENT OUTSIDE OF AGRICULTURE.

AGE AND GENDER DIFFERENCE IN EMPLOYMENT OPTIONS WHEN EXTREME WEATHER OCCURS

Table 6.1 presents the association between extreme weather events and rural workers' likelihood of engaging in either the agricultural or the non-agricultural sector. There are very few differences evident between youth and adults, implying that sectoral movements of workers due to weather shocks are unrelated to age. After exposure to extreme heat and floods, rural workers of all ages are less likely to engage in agriculture and are more likely to work in non-agricultural jobs. In contrast, if a drought occurs, rural workers reallocate their labour from non-agricultural sectors to agriculture.

TABLE 6.1 ADULTS ARE MORE LIKELY TO WORK IN AGRIFOOD SYSTEMS IN RESPONSE TO WEATHER SHOCKS THAN YOUNG PEOPLE, WHILE YOUNG WOMEN OFTEN SUSTAIN AGRICULTURAL PRODUCTION

	ADULTS	YOUTH	DIFF.	YOUNG MEN	YOUNG WOMEN	DIFF.
HEAT STRESS						
AGRICULTURE	-	-	(+)	-	-	-
NON-AGRICULTURE	+	+	(+)	+	+	+
FLOODS						
AGRICULTURE	-	-	-	-	(+)	+
NON-AGRICULTURE	+	+	(+)	+	(+)	-
DROUGHTS						
AGRICULTURE	+	+	(+)	(-)	+	+
NON-AGRICULTURE	-	(-)	(+)	(+)	(-)	-

Notes: The table represents the effects of extreme weather events on the likelihood of working individuals (defined as having worked for at least one hour in the week of reference, including work performed on the household farm or in a family business) engaging in the respective sectors. Effects in brackets are not statistically significant. The difference is calculated as young – old and women – men, respectively.

Source: Kluth, J. Rossi, J.M. & Sitko, N. Forthcoming. *Climate shocks and youth labour: Gender-disaggregated evidence from SSA.* ESP working paper series. Rome, FAO.

Conversely, the table reveals numerous differences between young women and men. Heat stress induces a shift of young workers from the agricultural to the non-agricultural sector, which is more pronounced among young women. At the same time, young men who remain in agriculture increase their time spent on the farm by about an hour more per week in an average year, while young women's working time does not change (results for working times in the different sectors are not shown). Thus, young men who maintain their engagement in agriculture compensate for decreased participation among adults and young women by working more. Moreover, both young women and men who engage in non-agricultural work increase their working times, though the effect is stronger among young men. The welfare implications of this trend depend on the quality of the jobs that are offered outside of agriculture for young people.

In contrast to the findings of this report, a previous cross-country study found that women from rural areas in 29 African countries decreased their working times in agriculture in response to heat stress, but to a smaller extent than men.[67] However, the comparability of the results is limited due to differences in the estimation samples and the definition of climate shocks.

When exposed to floods and droughts, working young women are more likely to engage in agriculture and less likely to engage in non-agricultural jobs than working young men. Moreover, in an average year, floods are associated with a larger increase in the weekly agricultural working time by young women relative to young men, while the general trend among youth and adults is to reduce working hours dedicated to agriculture. Decreased participation of women in non-agricultural jobs due to droughts is also found among youth in India[68] and among youth and adults in Lesotho.[69] According to the Lesotho study, this trend arises because most of women's non-agricultural jobs are linked to agriculture (e.g. sales of grains or livestock), and therefore are more susceptible to droughts.[69] In addition, the finding likely reflects women's responsibility for procuring food for the household, which becomes more time-consuming as agricultural productivity contracts in times of drought.

YOUTH RESILIENCE IN CONFLICT AND PROTRACTED CRISES

The political discourse on youth and conflicts focuses disproportionately on the role of young people, particularly disenfranchised young men, as instigators of violence.[70–72] Moreover, demographic youth bulges are often framed as a factor contributing to the conditions necessary for conflicts to emerge.[72–74] Indeed, many armed groups rely on disenfranchised youth as a source of recruitment, and for many young people who join these groups the choice is often driven more by economic necessity than ideology (Spotlight 6.1). Yet, most youth living in conflict-prone regions, regardless of their economic conditions or gender, do not participate actively in armed violence. Instead, they are the direct and indirect victims of violence as well as being potential peace builders.[73] As the number of armed conflicts and protracted crises increase globally, it is critical to understand how youth are affected and how their resilience to these events can be enhanced.

Conflicts and crises affect youth along multiple and reinforcing dimensions with important differences between young men and women. The impacts can be personal, particularly for those directly affected by the trauma of violence. Experience of trauma during childhood can have a long-lasting effect on an individual's emotional and cognitive development, with negative implications for their educational attainment and labour market participation.[75] Beyond the direct personal experience of conflicts, these events can restrict economic opportunities for everyone through the destruction of infrastructure and assets, displacement of people from their homes, the closure of schools and the curtailment of private investments.[76–78] The contraction and displacement of economic activity caused by conflicts can be particularly damaging for youth, whose transition from education to the labour market is made more difficult by the economic challenges caused by these events, and can have lasting effects on youth's long-term earnings.[73]

During conflicts, women and girls often bear the sole or primary responsibility for ensuring the economic well-being of the family, regardless of whether or not male members of the family have actively joined the conflict.[79,80] This responsibility for care can push women to seek out high-risk income options, including sex work.[81] Conflicts are also frequently associated with increases in gender-based violence.[82, 83] Moreover, conflicts create conditions of risk and uncertainty that can, on the one hand, limit women's physical mobility within affected regions and, on the other hand, lead to their forced displacement.[84, 85] In some cases, exposure to conflict is found to increase incidences of child marriage.[86] The impacts of conflicts on human capital formation also differ by gender. However, these effects are highly context specific and are driven in large part by pre-war gender differences in educational attainment and labour market opportunities.[87]

Yet, conflicts can also create space for prevailing gendered norms to be disrupted and challenged. The increased economic responsibilities of women in conflicts and crises has been shown to enable women to exercise greater influence over economic and political decisions in their households and, to a lesser extent, their communities.[79] For example, in Angola and Somalia, rural people were displaced into urban economies where women's economic opportunities were greater, leading to greater economic dependence of men on women and increased respect by men for women's roles as breadwinners.[79]

Agriculture and agrifood systems have an especially important role to play in building youth resilience to conflict and in supporting peace. Armed conflicts are disproportionately concentrated in countries with relatively larger rural youth populations. Indeed, rural youth account for 60 percent of the total youth population in conflict-affected countries.[73] Land conflicts and constraints on agricultural production have been shown to escalate conflict intensity in fragile countries through various pathways, including lowering the opportunity costs of participating in conflicts, increasing opportunities for recruitment into conflicts and intensifying social grievances.[88, 89] Moreover, armed conflict can alter the trajectory of agricultural development and agricultural opportunities, effects that can persist even after a conflict has ended. Studies from Colombia and Nigeria show that armed conflicts lowered agricultural production and productivity through reduced labour supply and a contraction of cultivated land.[90, 91] In Mozambique, high-intensity conflict during the civil war eroded local institutions that protected the land rights of local people, making these areas prone to land expropriation by external actors after the end of the war.[92]

Yet, agrifood systems can also serve as a foundation for stability. Promoting and sustaining agricultural development has been shown to be critical, not only for the successful reduction of poverty, hunger and environmental degradation, but also for preventing and reducing conflict.[88, 93, 94] Achieving this objective requires understanding and addressing the ways in which young people's work opportunities in agrifood systems are affected by conflicts and crises, and building on the resilience they possess to promote and sustain positive agrifood system transformations. The next section provides new evidence on the experiences of youth in conflict and protracted crisis contexts, examining how living in such situations forms young people's subjective and material resilience, and how exposure to conflict shapes youth labour opportunities and choices in agrifood systems.

"YOUNG HOUSEHOLD HEADS HAVE A GREATER BELIEF IN THEIR ABILITIES TO ABSORB, ADAPT, AND TRANSFORM IN THE FACE OF SHOCKS AND STRESSES.

MATERIAL AND SUBJECTIVE RESILIENCE OF YOUTH IN PROTRACTED CRISIS CONTEXTS

As mentioned in the Introduction, resilience is shaped by both the physical resources an individual can mobilize to manage the impacts of shocks and stresses, and the psychological attributes they possess to cope with the mental stresses of uncertainty and risks. These different dimensions of resilience are particularly important in the context of protracted crisis, where people's material assets and their expectations for a better future are eroded by persistent conditions of conflict, uncertainty and weak governance.

Data from 3 106 households in countries with protracted crises (Palestine, Somalia, South Sudan and Yemen) are used to examine how people's material and subjective resilience capacities differ by age and gender (see Box 6.1).[i] Subjective resilience is often expected to be strongly correlated with the material resources a person can access, yet this is not always the case. In Uganda, a side-by-side comparison of subjective and objective resilience found only a weak correlation between the two measures.[4] The variation in subjective resilience was found to be significantly greater than objective measures, suggesting that in this context people's self-assessment of their own resilience is considerably more varied than their access to material resources.

i The estimation model used for this report uses age as a linear term, in quadratic and cubic form to allow for a non-linear relationship of age and resilience. All three age variables are interacted with a binary variable indicating whether the household is female headed. In addition, the model controls for the share of household members under the age of 18, the exposure to shock and country fixed effects. For all outcomes but the total Resilience Capacity Index (RCI), the RCI subcomponents are included, as they contain relevant household information.

BOX 6.1 MEASURING MATERIAL AND SUBJECTIVE RESILIENCE

Material resilience is measured through the Resilience Index Measurement and Analysis (RIMA) tool, which consists of four resilience pillars – access to basic services, assets, social safety nets and adaptive capacities, including education levels, income and crop diversification.[i] This measure provides insights into the resources and services that people can access to manage the impacts of shocks and stresses. Yet, this measure does not take into account the knowledge people have of their own abilities and the contextual information they possess to gauge their own resilience.[ii] To fill this gap, subjective information on one's perceived resilience is important. This report measures subjective resilience using the Subjective self-Evaluated Resilience Score (SERS) method, which asks questions related to individuals' beliefs in their own capacities to deal with shocks and stresses, focusing on their adaptive, transformative, absorptive and anticipatory capacities.

Notes: Refer to the **Notes section** for full citations.

Differences between material and subjective resilience capacities may be particularly important for youth. On the one hand, youth in agrifood systems control substantially fewer resources and assets, and have more limited access to services than adults, suggesting that in a material sense they will be less resilient to shocks and stresses (Chapter 3). On the other hand, youth may possess important "soft" attributes, such as self-confidence and sense of self-efficacy that can help them to confront and overcome shocks and stresses.[95–97] Understanding how youth differ from adults in both their material and subjective resilience in protracted crises can help to identify ways in which youth may be constrained in managing these crises and the attributes they possess that can be leveraged to enhance their well-being outcomes.

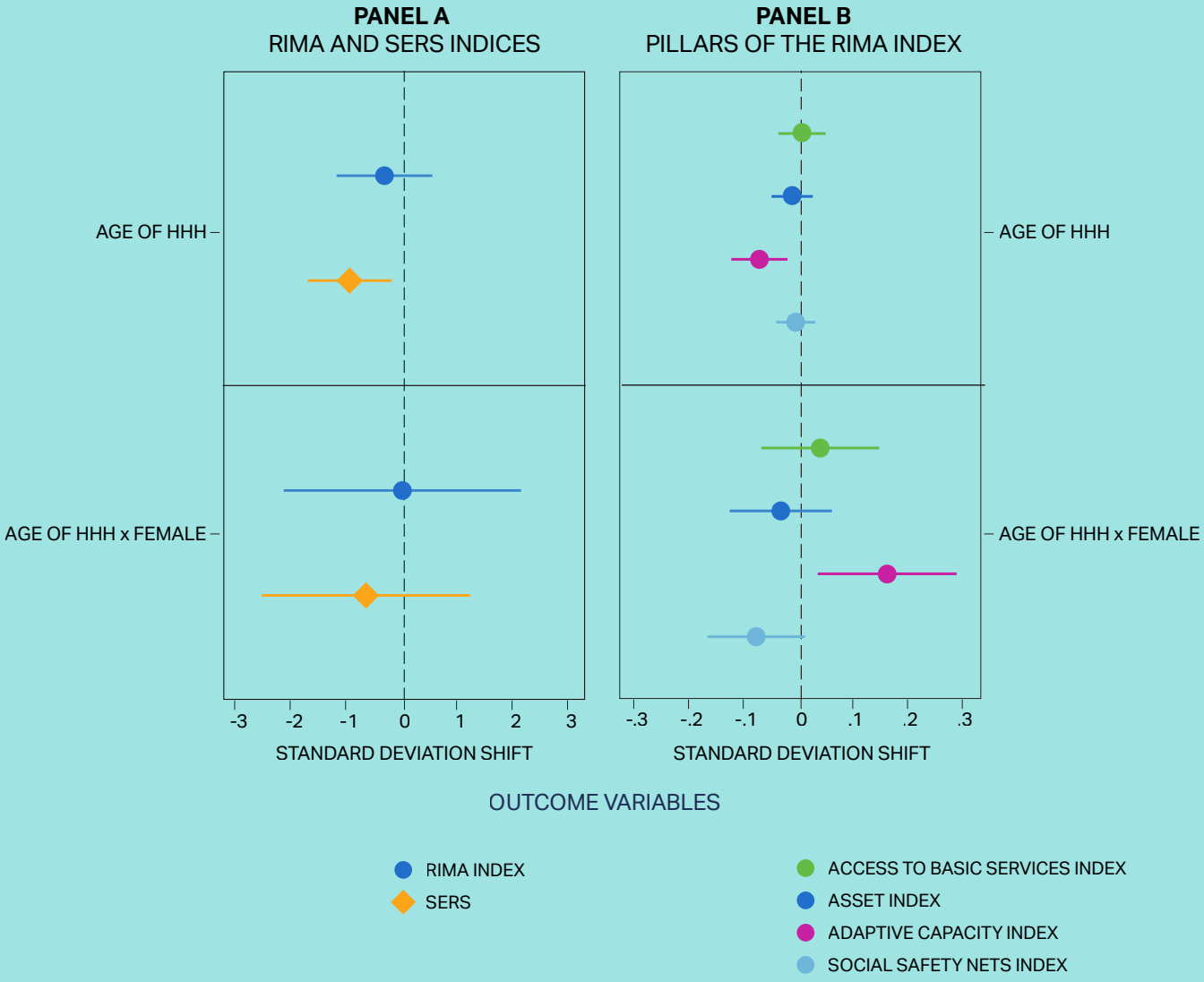
The results of the regression analysis for the four countries with protracted crises, presented in Figure 6.5, show surprisingly no difference in the overall RIMA index (material resilience) associated with age and gender (left panel). This finding stands in contrast to the global figures presented in Chapter 3, which demonstrated that youth-headed households tend to have fewer assets and less access to services. Yet, protracted crises are unique, and may lead to the widespread erosion of assets, infrastructure and services that affect everyone in a similar manner.

The overall RIMA score masks some important differences that can be observed when the index is decomposed into its four pillars. As shown in the right-hand panel of Figure 6.5, people's adaptive capacity declines significantly as they age, driven by a reduction in the capacities of male-headed households. While having on average less adaptive capacity than male-headed households, female-headed households do not display an observable decline in adaptive capacity associated with age. The adaptive capacity index includes variables such as the average education of the household members, crop diversification and income diversification. Even though the change with age is small, differences in these variables represent important attributes of youth which should be considered when making investments to support their resilience.

The left-hand panel of Figure 6.5 also displays the association of age and gender of the household head with subjective resilience, measured by the SERS. The figure shows that subjective resilience declines with age in protracted crisis countries, suggesting that youth tend to have higher levels of subjective resilience**.** The gender of the household head is not relevant. This lowering of resilience with increasing age is driven by age-related reductions in several domains of the SERS index: learning, political capital, absorptive and transformative capacities (see Table 6.2). These variables capture differences in people's belief in their abilities to bounce back from shocks, diversify their income to respond to future challenges and learn from past experiences. Together they point to important attributes of youth resilience associated with greater levels of perceived livelihood flexibility.

FIGURE 6.5

SUBJECTIVE RESILIENCE IS HIGHER AMONG YOUNG PEOPLE IN PROTRACTED CRISES, WHILE NO DIFFERENCES ARE FOUND FOR MATERIAL RESILIENCE



Notes: The figure presents the impact of age of the household head on six different resilience measures, separated by the sex of the household head (HHH). The upper coefficient group shows the main effect of the age of the HHH on the respective resilience measure. The lower group of coefficients shows the interaction effect for the age of the HHH and female headedness (age of HHH x female). The impact of age in male-headed households is shown by the "age of HHH" coefficient. The impact of age in female-headed households is the sum of the coefficient "age of HHH" and "age of HHH x female". The left panel shows the regression coefficients for the RIMA Index and the Subjective self-Estimated Resilience Score (SERS). The right panel displays the effect sizes for the subcomponents of the RIMA index: Access to Basic Services (ABS); Assets, Adaptive Capacity (AC); and Social Safety Nets (SSN). Coefficients of the same colour come from the same regression. Effects are statistically significant if the whisker bars representing 90-percent confidence intervals do not cross the zero line.

Source: Authors' own elaboration based on data from Khan Niazi, K., Pietrelli, R., Laborde, D. forthcoming. Youth resilience in protracted crises dimensions: A dual perspective on material and subjective. Rome, FAO.

TABLE 6.2 AS PEOPLE AGE IN PROTRACTED CRISES THEIR ABSORPTIVE AND TRANSFORMATIVE CAPACITIES DECLINE, ALONG WITH THEIR POLITICAL CAPITAL AND LEARNING

	(1) ABSORPTIVE CAPACITY	(2) TRANSFORMATIVE CAPACITY	(3) ADAPTIVE CAPACITY	(4) FINANCIAL CAPITAL	(5) SOCIAL CAPITAL	(6) POLITICAL CAPITAL	(7) LEARNING	(8) ANTICIPATORY CAPACITY	(9) EARLY WARNING
AGE OF HHH	-	-	(-)	(-)	(-)	-	-	(-)	(-)
FEMALE HHH	(-)	(+)	(-)	(+)	(-)	(-)	(+)	(+)	(+)
AGE X FEMALE	(+)	(-)	(+)	(-)	(+)	(+)	(-)	(-)	(-)

Note: The table represents the effects of age and sex of the household head on the nine dimensions of the SERS. The plus sign indicates a positive association, the minus sign indicates a negative association. Signs in brackets are not statistically significant.

Source: Authors' own elaboration based on data from Khan Niazi, K., Pietrelli, R., Laborde, D. forthcoming. Youth resilience in protracted crises dimensions: A dual perspective on material and subjective. Rome, FAO.

HOW CONFLICTS AFFECT THE LABOUR DECISIONS OF YOUNG WOMEN AND MEN

Armed conflicts not only pose physical dangers to people, they also have profound and long-lasting consequences for people's economic opportunities and well-being.[98, 99] Formal employment opportunities are often particularly strongly affected by conflicts. Studies from various contexts show that conflicts cause firms to reduce production, sales and employment, with smaller and newer firms being more likely to close entirely.[100,101] Conflicts also curtail many forms of productive and forward-looking entrepreneurship, and push people into more necessity-based forms of entrepreneurship.[102] This shift in employment opportunities has consequences for the current and future well-being of young people.

Agrifood system work can be both a livelihood refuge and a source of risk and tension for people in conflict contexts, depending on the context. In some cases, agrifood systems, and particularly primary agricultural production, can serve as an important source of livelihood for people in conflict settings, providing food and income when food markets have been disrupted and other economic activities are unavailable.[88] However, in many cases, work in agrifood systems in conflict settings is highly risky. Some conflicts revolve around tensions over land and natural resources, where attempts to utilize land can expose people to violence.[103] In other cases, a general lack of security increases the risks to people working in agriculture to various forms of violence, including sexual and physical violence.[87] As a result, exposure to conflict is often associated with a reduction in agricultural production, agricultural land use and agricultural labour.[90, 104]

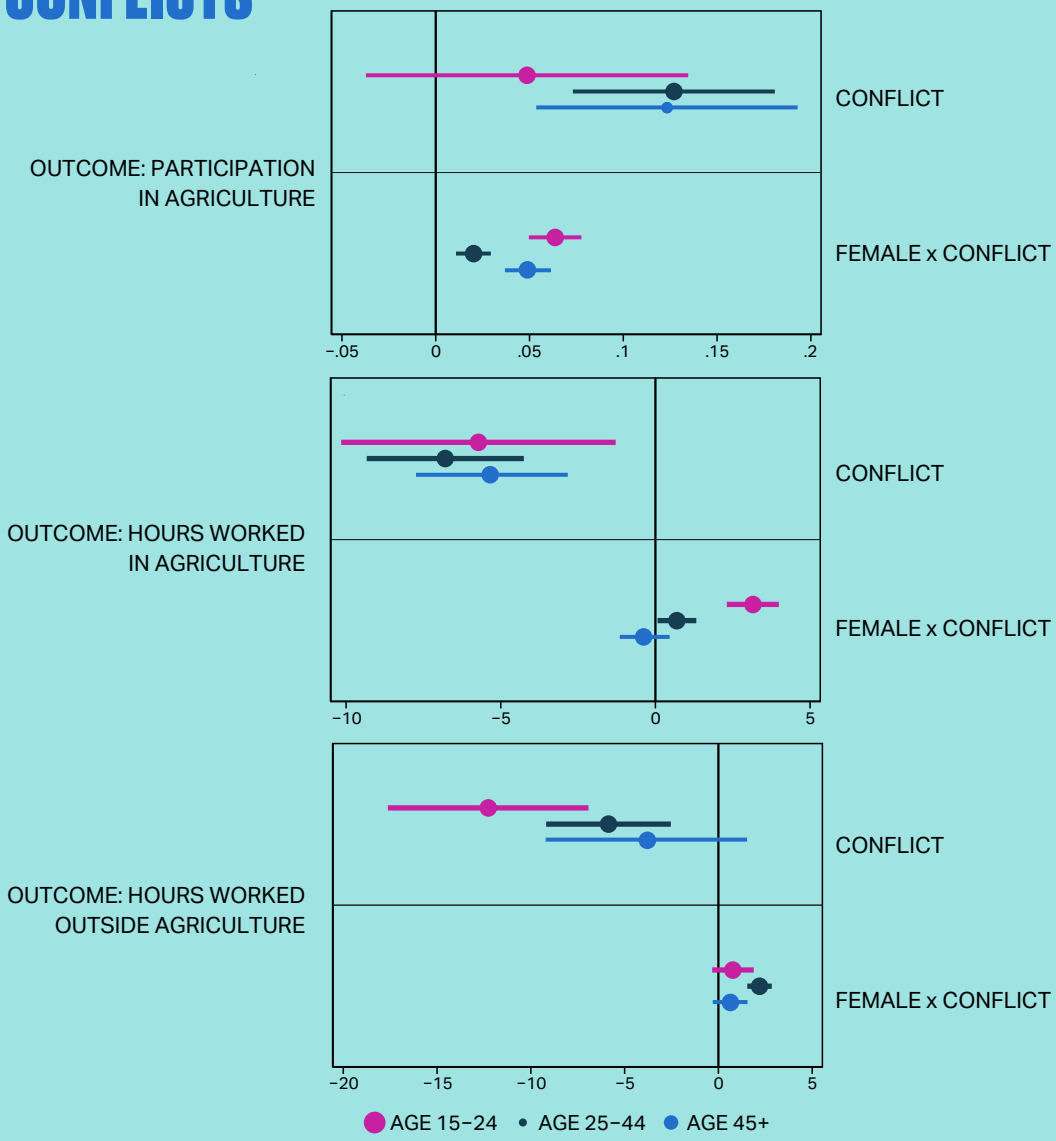
New evidence presented here on the relationship between exposure to conflict and labour outcomes of rural people in 29 African countries shows that conflict exposure increases the likelihood of working in agriculture among adults, although their total working hours are reduced (see Figure 6.6). This suggests that adults in general are pulled into agricultural work during conflicts. However, because of general insecurity they work fewer hours, perhaps because some fields are left fallow or other agricultural activities are curtailed due to security risks.[90] Important gender differences emerge in terms of agricultural work.

Women of all ages tend to work more in agriculture when conflicts occur, and young women also work longer hours. This is consistent with previous studies that show a general increase in female labour force participation in conflicts, a trend that is often linked to the temporary absence or permanent loss of male breadwinners.[79, 80, 106] Despite the risks associated with agricultural work, young women tend to work more hours in agriculture than older women and men, potentially elevating their risks of exposure to violence. However, regardless of the sector, women's employment in conflict contexts is typically low-paid, low-skilled and takes the form of informal self-employment or unpaid family labour.[107]

Addressing the impacts of conflicts on youth work opportunities is critical for building their resilience in the short term and enabling a positive transition into adulthood in the future. Recognizing and supporting the disproportionate burden and risks young women face in sustaining agricultural production is a key step. This includes providing them with the technologies and resources needed for effective agricultural production

FIGURE 6.6

YOUNG WOMEN SUSTAIN AGRICULTURAL PRODUCTION DURING CONFLICTS



Note: Effects are statistically significant if the whisker bars representing 90-percent confidence intervals do not cross the zero line.

Source: Authors' own elaboration using data from Rozani *et al.*[105]

while also recognizing the opportunity costs and physical risks they incur from this work. At the same time, efforts to support young men's employment during periods of conflict are critical. The exit of young men from work is both a cause and a symptom of conflict. Addressing the gendered division in agricultural work through gender transformative approaches, where feasible, is a potential first step to help balance the burden of agriculture work when conflicts arise.

> **"DURING ARMED CONFLICTS WOMEN'S EMPLOYMENT IN AGRICULTURE INCREASES COMPARED TO MEN.**

SPOTLIGHT 6.1 YOUTH RADICALIZATION AND PARTICIPATION IN ARMED CONFLICTS

The socioeconomic factors that make some youth susceptible to radicalization and participation in armed conflicts are complex and highly context specific. Yet underlying this complexity are often feelings of resentment that are rooted in persistent socioeconomic vulnerabilities and perceived political, social and economic inequalities between groups. These feelings of resentment can predispose people to radicalization or joining armed groups.[i]

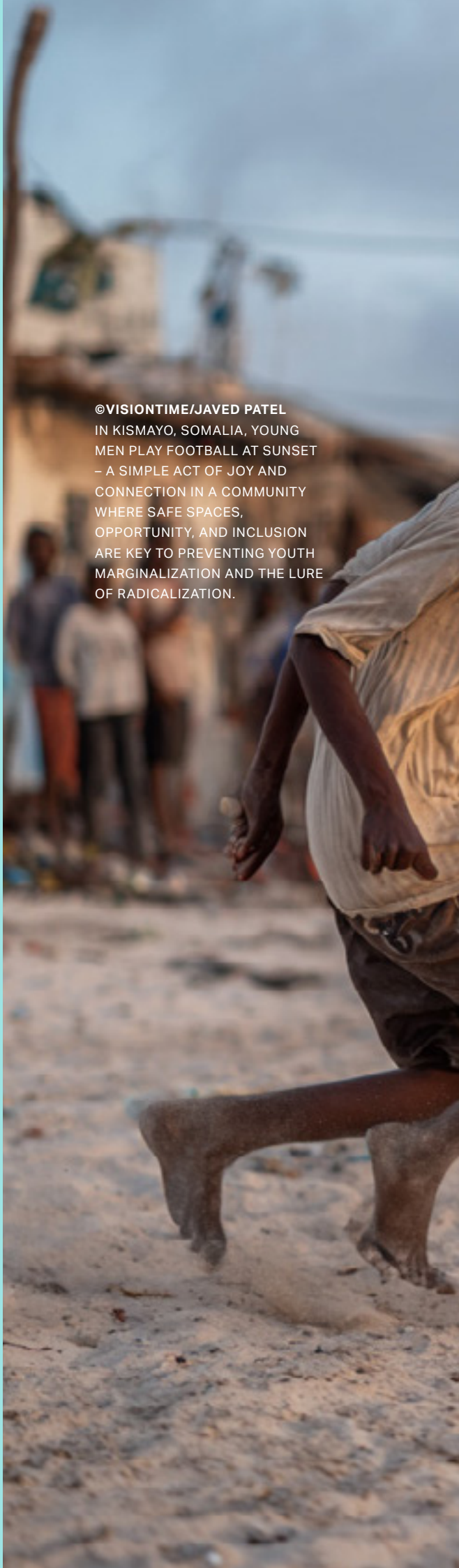
A lack of viable employment opportunities can be an important driver of youth radicalization and participation in armed conflicts. On the one hand, lack of economic opportunities is a source of grievance leveraged by groups to enrol youth.[ii] On the other hand, lack of economic alternatives lowers the opportunity costs of joining armed groups.[iii] In Nigeria, for example, the contraction of formal employment opportunities, combined with increased competition for informal and precarious work, contributed to rising frustration about the lack of economic opportunities among youth with lower education.[iv, v] Armed groups tapped into these grievances by positioning themselves as a way to fight against the system that contributed to youth's marginalization.[vi] In addition to providing an avenue to channel grievances, radical groups in Nigeria also provide needed networks for youth to access employment. For example, there is evidence that radical groups provide youth with needed social networks to engage in seasonal and permanent migration to urban areas.[vii–ix]

Radical groups also provide marginalized youth with opportunities to increase their social status and political power within their communities. In Haiti, for example, armed gangs recruit children and youth to reinforce their ranks and solidify their role and legitimacy within communities. These groups use youth to distribute food or cash to their communities, which helps the groups to gain validation and legitimacy, and provides youth with income and increased social recognition.[x] Increased authority and social power are often an important factor contributing to young woman's support for radical groups. At both the national and local level, women are often underrepresented in decision-making bodies in areas where armed groups are present. Evidence from Liptako-Gourma and Northern Nigeria suggests that the opportunity to gain influence and status incentivizes women to join armed groups.[xi] Moreover, women may join these groups to avoid risks of sexual violence associated with conflicts.[xii]

In-group socialization pressure and stigmatization by the broader community can perpetuate youth's engagement with armed groups. Youth who participate in armed groups often forgo educational opportunities and fail to develop employable skills, which limits their opportunities for economic and social advancement outside of the group.[xiii] In the aftermath of conflicts in Algeria, Liberia and Sierra Leone, for example, young demobilized soldiers found themselves similarly marginalized politically, economically and socially, as in the pre-war period.[xiv, xv] Lacking other opportunities, many returned to combat as mercenaries in regional conflicts.[vi]

Ultimately, the decision of youth to engage in armed violence is driven by both individual and community-level factors that are tied to legacies of perceived marginalization, deep-rooted social and economic grievances, and the need for protection. There is no one single driver of radicalization and no single profile of people most likely to be radicalized. As such, policies, strategies and programmes to counter radicalization must be contextualized, adaptable and engaged at the regional, national and local levels. Moreover, they must be cognizant of differences in economic constraints and opportunities faced by different people – based on factors such as age, gender, wealth, location and ethnicity – and the ways in which these are shaped by policies, norms and institutional factors.

Notes: Refer to the **Notes section** for full citations.



©VISIONTIME/JAVED PATEL
IN KISMAYO, SOMALIA, YOUNG MEN PLAY FOOTBALL AT SUNSET – A SIMPLE ACT OF JOY AND CONNECTION IN A COMMUNITY WHERE SAFE SPACES, OPPORTUNITY, AND INCLUSION ARE KEY TO PREVENTING YOUTH MARGINALIZATION AND THE LURE OF RADICALIZATION.

SOLUTIONS MOVE FOOD FORWARD

© FAO/VÍCTOR FARFÁN
INGRID RAMÍREZ, AGED 27, CHECKS THE RESULTS OF WATER MANAGEMENT IN HER GREENHOUSE.

07
MAKING AGRIFOOD SYSTEMS WORK FOR YOUTH

© FAO/DAVID HOGSHOLT
IN SINACABAN, MISAMIS OCCIDENTAL IN THE PHILIPPINES, ROSEMARIE BUSADRE, AGED 22, ARRANGES FISH FOR SALE.

KEY MESSAGES

- Youth-inclusive agrifood systems transformation requires efforts that expand economic opportunities in the broader economy and empower youth with the requisite skills, agency and resources to harness available opportunities. These efforts acknowledge the diverse circumstances and needs of youth, address specific vulnerabilities and promote meaningful engagement for all.
- Broad-based productivity growth, both on and off-farm, stimulates rural and structural transformation and in many contexts is essential to make agrifood systems work for youth, raise incomes and create decent jobs across the wider economy.
- The creation of decent jobs for youth in agrifood systems requires broader reforms that promote the progressive formalization of economies, address widespread labour rights violations, enhance workplace safety, increase youth's awareness of their rights and strengthen social protection systems for all.
- Creating an enabling environment for agrifood enterprises, through access to credit, training and infrastructure, can further boost youth job opportunities and promote economic stability.
- Youth-specific nutrition policies that enhance access to healthy diets, strengthen food literacy and skills, and regulate harmful food marketing are essential for improving the food environment and promoting healthy eating habits.
- Targeting youth with social protection programmes specifically designed to address their vulnerabilities, and that provide capacity development on sustainable and productivity-enhancing technologies, are crucial for building youth resilience to shocks, protecting assets, sustaining consumption and promoting productive activities.
- Youth agency, visibility and empowerment in policymaking spaces can be strengthened through meaningful participation in youth-led organizations and networks. Such collective action can help young people expand their influence and better navigate power relations.
- Inclusive policies that prioritize youth, adopt transformative approaches, and address existing agency and resource access barriers affecting vulnerable and marginalized young people, are critical to foster equitable participation opportunities for youth in agrifood systems.
- Youth need skills to harness agrifood opportunities and navigate shocks. Effective skills training programmes integrate access to productive resources, emphasize practical and hands-on learning, and adapt to youth and local market needs.
- More empirical evidence and age- and sex-disaggregated data are needed to better understand the diverse realities of youth in agrifood systems and assess the impact of programmes on their engagement, food security and resilience.

- Youth-inclusive agrifood systems transformation demands strong commitments from diverse stakeholders, robust evidence, broader inclusion and greater investment. Sustaining and scaling progress calls for stakeholders to inquire more, include more and invest more to strengthen evidence, empower youth and accelerate structural change.
- Promoting youth engagement in agrifood systems is a strategic investment in global prosperity. Eliminating youth unemployment and integrating NEET youth aged 20–24 into the workforce could boost global GDP by 1.4 percent (USD 1.5 trillion), with agrifood systems alone contributing 45 percent of that estimated growth (USD 680 billion).

©VISIONTIME/MELANIE BOUTROS
IN AMMAN'S CENTRAL MARKET FOR FRUITS AND VEGETABLES, A YOUNG VENDOR USES HIS SMARTPHONE TO PRICE AND TRACK PRODUCE AT HIS STALL. YOUTH ARE BRINGING DIGITAL INNOVATION TO TRADITIONAL AGRIFOOD MARKETS.

INTRODUCTION

Inclusive agrifood systems are vital to achieving global sustainability and prosperity. A key prerequisite to building more inclusive agrifood systems is youth engagement. Young people make up a significant share of the population in many countries, particularly those with traditional and protracted crisis agrifood systems. Accordingly, youth labour, advocacy and consumption patterns are essential for building resilient, equitable and prosperous agrifood systems. In countries with smaller and shrinking youth populations, young people are vital to filling labour gaps, driving innovations and revitalizing rural areas. As outlined in the conceptual framework in Chapter 1, successfully integrating youth into agrifood systems requires intentional efforts that expand economic opportunities and empower young people.

Historically, transforming agrifood systems through broad-based productivity growth, both on and off-farm, stimulates rural and structural transformation and has been key to job creation, income growth and poverty reduction.[1] Investments that spur productivity growth create an enabling environment for agrifood enterprises, expanding opportunities for youth entrepreneurs and offering more rewarding jobs off-farm with better working conditions.[2, 3] Moreover, improvements in agricultural practices, expanded market access and diversified local economies drive rural transformation with increases in the availability and accessibility of nutritious foods.[4,5] Embedding sustainability, innovation and livelihoods diversification in the transformation process strengthens the resilience of communities, and the youth within them, enabling them to more effectively navigate economic and environmental shocks. Measures promoting broad-based productivity growth, designed to accelerate the transformation of agrifood systems and overall rural and structural transformation, are a cornerstone in the cultivation of youth-inclusive agrifood systems, helping to provide decent jobs, advance nutritional well-being and foster resilience among the rising generation.

> “INTEGRATING YOUTH INTO AGRIFOOD SYSTEMS REQUIRES EXPANDING OPPORTUNITIES AND EMPOWERING THEM WITH SKILLS, AGENCY, AND RESOURCES.

However, growth in opportunities does not automatically translate into direct access for youth. Complementary efforts are needed to empower youth with the agency, skills and resources necessary to engage in and influence agrifood systems transformation processes and partake in the outcomes. Yet, youth participation in agrifood systems decision-making is often constrained. Strengthening youth as key stakeholders fosters ownership and ensures that policies and programmes adequately reflect their needs. Moreover, youth need specific skills and education to contribute effectively in agrifood systems that are increasingly knowledge-based and technology-intensive. However, as discussed in Chapter 3, many rural youth lack access to quality education and skills training. Socioeconomic barriers, poor educational infrastructure and a misalignment between educational programmes and the demands of modern agrifood systems have limited the ability of many young people to fully seize agrifood systems

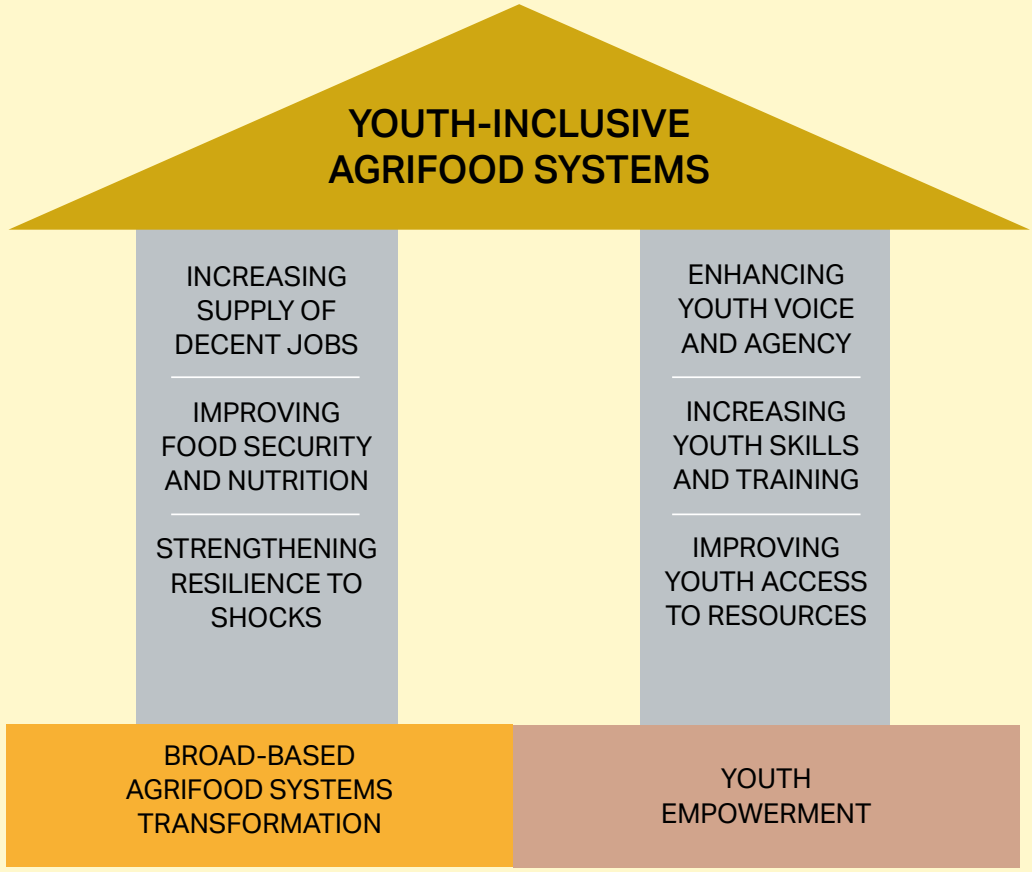
opportunities.[6, 7] At the same time, restrictive land tenure systems, inheritance laws that favour older generations, an absence of legal recognition for youth, lack of credit histories, limited social capital and discriminatory social norms collectively undermine young people's access to critical resources needed to fully engage in agrifood systems, such as secure land, finance, technology, water, markets and market information (Chapter 3).[8, 9] Bridging these gaps is essential to harness the transformative potential youth bring to agrifood systems, which in turn can improve livelihoods and food security for both youth and society.

This chapter examines promising policies and programmes with the potential to engage youth and improve outcomes in agrifood systems. Drawing on policy analyses and experiences from past interventions, the chapter identifies approaches and design features that expand youth economic prospects while empowering them to actively drive and benefit from agrifood systems transformation. The chapter highlights two key dimensions: expanding youth opportunities and youth empowerment. In terms of opportunities for youth, the chapter focuses on programmes driving inclusive agrifood systems transformation to achieve three interconnected outcomes: 1) increasing supply of decent jobs; 2) improving food security and nutrition; and 3) strengthening resilience to shocks and stresses. In terms of empowerment, the chapter examines interventions in three interrelated areas: 1) enhancing youth voice and agency; 2) increasing skills acquisition and training; and 3) improving access to resources (see Figure 7.1). While discussed separately, these six areas are interdependent: progress in one area reinforces advancements in others, collectively creating an environment that enables youth to thrive and contribute to agrifood systems transformation. The chapter concludes with recommendations for moving forward, focusing on approaches to inquire more, include more and invest more to ensure that youth are at the centre of agrifood systems transformation.

©IFAD/ANDREW ESIEBO
IN OSI COMMUNITY NEAR AKURE, NIGERIA, FISH FARMER OMOTAYO SAMUEL USES TREE-LEAF EXTRACTS AS NATURAL ANTIBIOTICS AND RECYCLES NUTRIENT-RICH POND WATER TO GROW BOTH FISH AND VEGETABLES—EXEMPLIFYING RURAL ENTREPRENEURIAL RESILIENCE.

FIGURE 7.1

YOUTH-INCLUSIVE AGRIFOOD SYSTEMS DEMAND STRATEGIES THAT COMBINE BROAD-BASED TRANSFORMATION WITH YOUTH EMPOWERMENT



Source: Author's own elaboration.

INCREASING SUPPLY OF DECENT JOBS

Most rural youth reside in countries characterized by traditional or protracted crisis agrifood systems (Chapter 2) and rely in large part on agrifood systems for their livelihoods (Chapter 4). However, young workers fare worse than older workers across most dimensions of decent work, except in wages where no youth–adult wage gap was observed.[10,11] Ensuring access to decent work is therefore critical for youth in agrifood systems.

The available evidence on programmes aimed at improving job quality focuses primarily on wage-related aspects, with non-wage dimensions of decent work addressed less frequently. Studies specifically targeting job quality in agrifood systems are even rarer. Nevertheless, the available studies offer some insights into key areas of investment that could expand both the quantity and quality of decent work for youth.

FOSTER BROAD-BASED PRODUCTIVITY GROWTH FOR ACCELERATED STRUCTURAL TRANSFORMATION

Accelerating structural transformation is essential to address the lack of decent jobs in agrifood systems and to expand employment opportunities for youth. This transformation process is dependent on broad-based productivity growth[2, 3, 12, 14] – improvements in efficiency and output that encompass a wide range of actors and commodities across agrifood systems.[1,14,15] Unlike growth concentrated among a few actors and commodities, this inclusive approach often generates the multiplier effects needed to stimulate structural transformation.[1, 2, 15] It is underpinned by climate-resilient and context-specific innovations that optimize resource use,[16, 17] typically generated through international and national research and development (R&D), and extension services.[17] Public investment in agricultural R&D is highly cost-effective, with estimated social returns averaging over 40 percent annually,[17–19] yet funding remains low, especially in lower-income countries. As mentioned in Chapter 3, technology and innovations can encourage youth participation in agrifood systems, and research conducted as a public good helps to deliver cutting-edge agricultural innovations in developing regions.[20]

> “ACCELERATING STRUCTURAL TRANSFORMATION THROUGH PRODUCTIVITY-ENHANCING INVESTMENTS UNLOCKS AGRIFOOD JOBS AND ENTREPRENEURIAL OPPORTUNITIES FOR YOUTH.

However, complementary investments to enhance the flexibility of intellectual property laws and strengthen the capacity of national research systems are needed to support the adoption, contextualization and scaling of these innovations.[21] Robust extension systems are equally essential to foster two-way learning between research institutions and actors in agrifood systems, encouraging forms of adaptation that align with real-world conditions and resource contraints.[21]

Investments in physical and digital infrastructure are similarly vital for promoting broad-based productivity growth in agrifood systems. Upgrading the coverage and quality of rural infrastructure (e.g. roads and reliable, affordable energy) reduces transaction costs and enhances connectivity. Improved road infrastructure, particularly paved roads, can address mobility challenges and create new economic opportunities. In rural areas, roads are often seen by young people as pathways to better income prospects, prompting shifts from agricultural work to formal labour market participation. Studies in India, for instance, show that road construction contributes significantly to helping young people, particularly women, transition out of agriculture into wage employment.[22] Similarly, cross-sectional data from 31 countries in sub-Saharan Africa show that proximity to paved roads is associated with reduced probability of unemployment among rural youth, with stronger impacts for young women.[23] In Morocco, enhanced road access led to increased secondary school enrolment among young women and a reduction in early marriages, likely due to improved commuting options. For young men, road improvements primarily facilitated access to wage employment, with only a limited impact on educational attainment.[24]

In addition, specific agrifood systems infrastructure projects related, for example, to irrigation systems and food processing facilities can bolster agricultural productivity, boost value addition and expand job opportunities along value chains.[8, 16, 17] Furthermore, extending digital infrastructure to rural areas promotes innovation, strengthens rural-urban linkages and opens up new market opportunities for youth and other stakeholders.

Targeted public investments can create an enabling environment that incentivizes private-sector engagement in agro-based industries, promotes value addition and strengthens cross-sector linkages to transform agrifood systems into a dynamic sector where youth can thrive. An analysis of the Enabling Business in Agriculture indicator reveals that rural youth in countries with consistent improvements in their enabling environments experience higher returns on their labour in agriculture, as well as lower poverty rates,[25] underlining the importance of institutional reforms for youth livelihoods.

Regarding entrepreneurship, youth-led enterprises merit support but multiple studies show that rural youth entrepreneurship often fails to generate large-scale employment or sustainable livelihoods due to high start-up failure rates and limited resources.[26] Meanwhile, enterprises managed by older adults frequently exhibit greater stability and a stronger capacity to employ young people.[25] Evidence suggests that firm-level interventions aimed at more established agri-enterprises – those already performing well under local conditions – are likely to boost youth job opportunities.[27] Moreover, targeting skills training to higher-productivity firms and strategic industries has yielded more job creation and economic growth than untargeted approaches.[28] Supporting companies with solid market potential and growth prospects can effectively stimulate youth employment and contribute to broader economic development.

RAISE AWARENESS ABOUT AND PROTECT THE LABOUR RIGHTS OF YOUNG WORKERS

While demand for youth labour is growing, targeted policies and programmes are necessary to ensure decent employment. Such efforts should prioritize measures to protect the fundamental principles and rights at work, including freedom of association, elimination of all forms of forced or compulsory labour, the abolition of child labour, the elimination of discrimination, and a safe and healthy working environment.[29, 30] Fair[j] and ethical recruitment practices and safe pathways for youth

j Fair recruitment implies that migrants are not charged recruitment fees, retain control of official documents, are offered pre-departure and post-arrival training, and are fully informed about employment terms before making the decision to migrate.[36]

mobility are necessary to prevent labour abuses such as forced labour and debt bondage. In agrifood systems, improving labour standards is critical, especially given young people's negative perception of agrifood systems jobs.[32]

The international legal framework for decent work is based on the International Labour Standards (ILS), a body of legal instruments developed by the International Labour Organization (ILO) that protects workers' rights and includes youth-specific provisions.[33, 34] However, implementation of this framework remains challenging, particularly in the context of agrifood systems, where informality is widespread. Informal workers in agrifood systems are often excluded from national labour laws or left unprotected due to weak enforcement, especially in rural areas[34, 35] – in part due to the relatively high cost of compliance for informal enterprises. At the heart of this issue is a key dilemma – how to promote a progressive transition from the informal to the formal economy without undermining the informal sector's role as a source of employment and income for youth and the overall population.[36] Voluntary options such as responsible business conduct or approaches linked to third-party certification, including Fairtrade, can promote decent work in rural areas, although their ability to improve workers' rights and address structural inequalities may vary by context.[37–39]

Awareness-raising initiatives and monitoring mechanisms involving all agrifood system stakeholders, including youth, have been used to uphold labour rights in some settings,[40] although evidence of their impact is limited. In India, the "Youth Knowledge Hub" project raises awareness of decent income livelihood opportunities, supports skill development and empowers communities to form youth producers' groups while encouraging young workers to become Fairtrade youth champions.[41]

Safety at work is also a key consideration for youth, and one that requires stronger occupational safety and health (OSH) measures**,** including raising awareness about reporting and notifying occupational injuries and illnesses.[42] Initiatives such as the Youth in Agriculture e-Tool, for instance, offer resources on common agricultural hazards and practical safety solutions for both employers and young workers, raise awareness of OSH and facilitate youth-related injury reporting in agriculture.[43] While research from low-income countries remains limited, existing studies emphasize the necessity of involving young workers, parents, employers and communities in protecting youth in the workplace.[44, 45] They also indicate that educational interventions alone will not suffice. Creating a safe working environment for youth also demands policies, standards and regulations, and enforcement mechanisms.[45] Local and participatory approaches, such as the low-cost work improvement in neighbourhood development (WIND) approach for farmers, although not youth-specific, has shown promise in improving OSH in informal rural settings.[46, 47]

Young migrants are particularly vulnerable to exploitation in the labour market and need specific support. Targeted information campaigns and migrant resource centres (MRCs) have been shown to improve access to safe migration and work-related information, while reducing intentions of youth to embark on unsafe migration through irregular channels.[48, 49] For example, in Senegal, awareness campaigns lowered irregular migration intentions by 20 percent.[50] Similar findings were observed in Guinea where awareness campaigns employed mobile cinema screenings.[51] In Nigeria, a campaign reduced trafficking vulnerability by 50 percent and increased proactive steps toward safe migration by the same margin.[49] Similarly, MRCs and pre-departure programmes equip migrants with crucial information.[52] A study in Afghanistan, Bangladesh, Iraq and Pakistan found that counselling and orientation sessions significantly reduce irregular migration intentions and improve awareness of safe options.[53] Indeed, India,[55] Nepal,[56] Senegal[54] and Uganda are implementing radio campaigns, social media outreach and mobile resource centres to inform rural youth about migration risks, alternatives to migration and agrifood system opportunities, including climate-adaptive agriculture.

PROMOTING THE PROGRESSIVE FORMALIZATION OF AGRIFOOD SYSTEMS ECONOMIES

Supporting the progressive formalization of agrifood systems economies can improve job quality by encouraging businesses to comply with relevant laws and regulations.[57] Achieving this goal requires lowering barriers to formalization and incentivizing enterprises to operate within the formal sector. Such efforts may include streamlining business registration processes to reduce costs and regulatory burdens and linking formalization to economic support programmes or benefits like tax incentives and government contracts. A

project in Lebanon, for instance, required registration as a prerequisite for youth- and women-led agri-enterprises seeking assistance to develop export skills. This initiative encouraged formalization by demonstrating the advantages of belonging to the formal sector – such as access to markets and support programmes.[58]

Fostering group cooperation and access to social protection can help promote the progressive formalization of agrifood systems economies. Cooperatives and associations facilitate the transition to formality for youth and micro-entrepreneurs by pooling resources, for example through saving groups, reducing entry barriers to markets and accessing social security mechanisms for informal workers. Examples of the latter include Peasants' Social Insurance in Ecuador and the group insurance system of the Self-Employed Women's Association in India.[59] Initiatives to expand access to social protection for youth, who make up a significant proportion of informal workers and informal enterprises, were observed in particular during the COVID-19 outbreak.[60] Enhancing access to social protection through expanded non-contributory benefits, extending social insurance to rural workers and making social benefits portable across borders for migrants in industrialized agrifood systems[61] are all examples of successful approaches supporting the progressive formalization of rural economies.

Responsible contract farming[62] and other formalized value chain arrangements can also significantly improve youth incomes and job prospects. Several case studies have reported improvements in terms of contract farmers hiring more labour or paying higher wages in Pakistan,[63] youth increasing crop and household incomes in the United Republic of Tanzania,[64] or young people benefiting from jobs and better incomes in Rwanda.[65] However, the studies also highlighted several factors, including ownership and size of land and access to resources, that influence young farmers' engagement and performance in contract farming.[64, 65]

IMPROVING FOOD SECURITY AND NUTRITION

Enhancing food security and nutrition for young people requires policies and interventions that specifically address the unique challenges youth face in accessing and consuming healthy diets. Despite the critical role nutrition plays in shaping long-term health and economic potential, youth remain underprioritized in national policies and agrifood system transformation efforts (Chapter 5). Addressing these gaps requires a multi-pronged approach that integrates youth-specific policies to expand access to healthy diets, strengthens food literacy and skills development, and enforces regulatory measures to limit harmful food marketing.

MAKE YOUTH ACCESS TO HEALTHY DIETS CENTRAL TO AGRIFOOD SYSTEMS TRANSFORMATION

Youth access to healthy food remains a low priority in national policies. Most countries focus primarily on infants and children aged under five, leaving few initiatives to support youth nutrition. While some countries, such as Indonesia, have introduced youth-targeted nutrition programmes,[66] including iron-folic acid supplementation for young women and obesity prevention programmes for youth, youth remain underrepresented in national

development agendas. To secure the next generation's health and economic potential, agrifood systems transformation must integrate youth-specific policies that improve access to nutritious foods.

Large-scale food fortification, particularly iron-fortified flour, can help address micronutrient deficiencies among youth, as demonstrated by its success in reducing anaemia in women of reproductive age.[67] However, availability, cost and acceptability challenges hinder widespread adoption.[68] As agrifood systems transform, expanding these programmes to high-need areas, along with quality assurance monitoring to ensure compliance and effectiveness, is essential.[69–72] Similarly, strengthening policies that mandate the food industry to enhance the availability and nutritional quality of food, while regulating unhealthy food marketing, can significantly impact youth diets.[72, 73]

Making healthy diets central to agrifood systems transformation require multisectoral collaboration and tailored interventions. India's knowledge-centred approach to reducing anaemia among adolescent girls highlights the effectiveness of partnerships between government and development organizations.[74] Similar collaborations involving multiple stakeholders (e.g. national and sub-national government, community, non-governmental and private actors) and youth engagement can help scale youth-focused interventions. These collaborations should include advocacy, mass and local media engagement, technical assistance, and monitoring and evaluation to ensure sustained impact.

Additionally, careful considerations are needed for youth migrants, refugees and internally displaced persons (IDPs), since the host community food environment may be different from their own, and constraints for these young people may differ. Furthermore, food assistance programmes may not be accessible for these groups, as lack of mobility (transport), knowledge, time, resources, literacy and digital literacy, concerns about immigration status, stigma and culturally inappropriate food may hinder them from accessing such programmes.[75] Addressing the nutritional needs of young migrants, refugees and IDPs requires a multifaceted approach. Measures that have been found effective in improving the food security of young migrants, refugees and IDPs include emergency food aid, school feeding programmes,[76, 77] community-based nutrition interventions (i.e. community kitchens, community gardens),[78] nutrition education programmes aimed at improving dietary habits,[79, 80] monitoring and screening for malnutrition,[81, 82] and long-term resilience-building efforts.[83–85] Effective measures should focus not only on providing immediate relief but also on improving long-term health outcomes and self-sufficiency. Collaboration between governments, aid organizations and host communities is essential to enhance effectiveness and sustainability in this regard.

SUPPORT YOUTH KNOWLEDGE AND SKILLS DEVELOPMENT PROMOTING HEALTHIER DIETS

Enhancing food security and nutrition among youth requires targeted efforts that engage with both young people and their families. While families, especially parents, play a vital role in shaping youth's dietary habits, targeted programmes that build young people's knowledge, skills and self-efficacy in food preparation, decision-making and healthy eating practices, can reinforce and complement family influences. Programmes that promote self-efficacy in meal preparation from an early age can encourage lifelong healthy dietary habits, such as increased fruit and vegetable intake and reduced fast food consumption later in life.[86–88] Food literacy initiatives in both school and community settings, as well as early engagement of youth in food-related decisions, also foster self-regulation and internalization of healthy eating norms among youth.[89]

> "FOOD LITERACY INITIATIVES AND EARLY INVOLVEMENT OF YOUTH IN FOOD DECISIONS PROMOTE LIFELONG HEALTHY DIETARY HABITS.

School-based nutrition programmes play a critical role in shaping dietary behaviours,[90, 91] but they often have mixed impact on nutrition[92] and growth outcomes[93, 94] due to the high variability in meal composition, implementation and regularity. Establishing robust nutrition standards for school meals can ensure consistency in quality and accessibility.[94–97] Combining nutrition education with environmental changes, such as regulating unhealthy food sales near schools, can reinforce positive dietary behaviours.[95, 98–100] Expanding these initiatives to reach more youth, especially those outside formal education systems, is essential to addressing nutritional disparities.

Community and digital platforms offer effective channels for reaching out-of-school youth. Peer educators, community-based initiatives and faith-based organizations have successfully engaged young people in nutrition and health education.[101] In Kenya, for example, community-based initiatives have reduced geophagia (the practice of eating soil or rocks).[102] Social media and mobile health interventions also provide additional opportunities to deliver nutrition information, behavioural support and food literacy programmes at scale.[103] In Brazil and Mexico, for example, digital programmes have effectively promoted fruit and vegetable consumption.[104] However, while digital platforms can promote healthy diets, they also expose youth to unhealthy food advertising, which can influence their consumption behaviours and have a negative impact on their long-term health.

STRENGTHEN FOOD MARKETING REGULATIONS TO PROTECT YOUTH

Strengthening food marketing regulations is essential to protect youth from exposure to unhealthy food advertising. While protections from harmful marketing exist for children, they tend to weaken with age, leaving youth increasingly vulnerable. Regulatory approaches vary globally, consisting of a mix of self-regulation, co-regulation and statutory instruments.[105] Although mandatory regulations have reduced exposure to unhealthy food advertisements,[106] no country has fully restricted all forms of unhealthy food marketing.[107] Loopholes and lax enforcement[105] allow unhealthy food promotion to persist, particularly through digital and social media channels, where influencers amplify brand messaging and normalize unhealthy food choices.[108]

Expanding regulations to cover internet-based advertising can help better protect youth.[108] Additionally, disseminating food literacy programmes can equip youth to navigate the marketing landscape.[109] To ensure meaningful impact, governments and regulatory bodies must also strengthen enforcement mechanisms, close existing loopholes and increase transparency in food marketing practices.[105, 107] Engaging youth in public health discussions and leveraging their voices in advocacy efforts can further drive policy improvements.[110–112]

Youth-led movements and initiatives can advocate for sustainable, culturally relevant agrifood systems, countering the aggressive marketing of unhealthy foods. Promoting traditional diets rich in fruits, vegetables, whole grains and locally sourced nutrient-dense foods can help to reverse dietary shifts towards ultra-processed, nutrient-poor options. The participation of youth in food policy discussions and social movements for food justice plays a vital role in ensuring that healthy foods are accessible, affordable, desirable and convenient. For example, youth movements have advocated for transparent food labeling,[113] sugar taxes[114] and healthier school meals,[115] pushing for policies that support healthy diets.[116] In addition, young entrepreneurs have created sustainable food ventures, offering locally sourced, affordable alternatives to ultra-processed foods.[117] Strengthening such youth engagement in food policy and nutrition education will accelerate the shift toward healthier food environments and empower young people to make informed dietary choices.

STRENGTHENING YOUTH RESILIENCE IN AGRIFOOD SYSTEMS

As highlighted in Chapter 6, youth respond to shocks and stressors differently from adults, with further variations between young women and men. Available evidence provides insights into strategies and interventions that can strengthen youth's ability to navigate the impacts of adverse shocks and stressors on their wellbeing and their transition to adulthood in agrifood systems. A few key approaches are discussed below.

EDUCATE YOUTH ON PRODUCTIVITY- AND RESILIENCE-ENHANCING TECHNOLOGIES

Limited access to information and lack of technical expertise hampers young people's productivity and resilience.[118] Ecosystem-based approaches and climate adaptive agricultural practices, such as soil and water conservation practices, intercropping or the use of improved seeds, have been shown to increase yields and incomes and foster resilience to shocks.[119, 120] Crop diversification also plays an important role in the resilience of young households in areas of protracted crisis. Yet not all climate adaptive practices might be suitable for young farmers. Smaller landholdings and financial constraints present obstacles to implementing land- and capital-intensive practices such as agroforestry and erosion prevention infrastructure.[121] Addressing these barriers through tailored policies, access to credit and innovative financing mechanisms will be crucial in enabling young farmers to adopt and benefit from resilience-enhancing technologies.

LEVERAGE SOCIAL PROTECTION TO HELP YOUTH IMPLEMENT RESILIENCE STRATEGIES

Too often, up-front costs associated with the adoption of long-term climate adaptive strategies, such as irrigation systems or agroforestry, are high, risky and often take time to yield returns. Young farmers need financial resources to cover the start-up costs and to manage uncertainties and risks related to the long-time horizon.[122] Given limited access to traditional financial services, social protection (see Box 7.1) can play a crucial role in providing incentives for the adoption of income diversification and climate adaptive livelihood strategies, thus supporting rural youth in adopting new approaches and diversifying their incomes, which can in turn lead to greater resilience.[122-124]

BOX 7.1 SOCIAL PROTECTION AND YOUTH

Social protection encompasses policies and programmes designed to prevent and mitigate poverty, vulnerability and social exclusion throughout the life cycle, with a focus on the most vulnerable groups.[i]

Social protection interventions are generally grouped into three main pillars: social assistance, social insurance and labour market interventions. Social assistance encompasses all non-contributory schemes targeted at households without alternative means of support and incorporates cash transfers (including cash plus or public works programmes) and in-kind transfers (including school feeding programmes). Contributory programmes established or mandated by governments to protect people from potential financial losses linked to life cycle-related events (e.g. pregnancy or old age), livelihood risks (e.g. unemployment or illness) or climate-related stresses (e.g. droughts or floods), are grouped under the social insurance pillar. Examples include unemployment insurance or pensions. Finally, labour market interventions comprise measures for the working age population that aim to enhance employment opportunities, improve workers' skills and offer livelihood support, and can include skills transfer programmes or employment guarantee schemes.[ii]

Well-crafted social protection interventions developed for youth play a fundamental role in supporting the transition to adulthood, especially for the most vulnerable.[iii] Social protection schemes can be specifically designed for youth: examples include scholarships, student loans and livelihood training developed to benefit young people with the objective of enhancing access to schooling, thereby increasing school attainment and employability. A study conducted in Ghana reveals that a scholarship programme targeted at students in secondary schooling greatly enhanced school attainment, modestly improved maths and reading comprehension, and improved tertiary schooling completion.[iv]

Additionally, more transversal social protection programmes (e.g. cash for work or cash plus) can be designed in ways to enhance opportunities for youth by employing dedicated targeting criteria. These programmes can have various objectives. For instance, key objectives for programmes prioritizing youth living in rural areas, who rely on agriculture as a source of livelihood, is to reduce their vulnerabilities and increase their adaptability to climate change, as discussed in this chapter.

Notes: Refer to the Notes section for full citations.

Cash transfers have been shown to increase investments in farm inputs and productive assets, improving productivity and, thereby, contributing to more resilient agricultural livelihoods.[125, 126] Moreover, in some contexts cash transfers encourage recipients to acquire assets, including farmland.[126] This is particularly relevant for young farmers, who are often constrained by smaller farm sizes.[122] Social protection can also promote access to information, support or training/extension services, for example on input use, marketing and market assets, entrepreneurial skills or agricultural value chain development) to assist young participants in utilizing the cash assistance provided, based on their needs and aspirations.[127]

Social protection programmes can also help farmers manage risks resulting from uncertain weather conditions, volatile prices and psychological stress.[126] For instance, Ethiopia's Productive Safety Net Program (PSNP) has successfully lowered the adverse impact of droughts on food security, benefiting particularly land poor households.[128] Meanwhile, social protection for youth working in the off-farm sector can complement job creation policies.[124] In Rwanda, cash transfers directed to youth in low-income households increased hours worked, income and the accumulation of productive asset and savings.[129] A programme in Sierra Leone, which provided small cash transfers conditional on attendance of business training during the Ebola outbreak, improved

employment and earning outcomes, while increasing food consumption in the households of female trainees and the accumulation of assets among male trainees.[130]

Similarly, Uganda's unconditional cash transfer programme for young entrepreneurs led to sustained improvement in earnings, business formality and job creation four years after the intervention.[131] Nine years after the grant distribution process, the income effects had levelled out, but recipients still owned more durable assets and were more likely to work in a skilled trade.[132] Social protection also allows young people to complete their education during times of economic downturn. In Malawi, both conditional and unconditional cash transfers to young women reduced school dropout rates, while unconditional transfers to out-of-school girls lowered early pregnancy and marriage rates.[133, 134–137, 138]

> **SOCIAL PROTECTION ENHANCES YOUTH RESILIENCE, ESPECIALLY WHEN BENEFITS ARE ADEQUATE, SUSTAINABLE, AND TAILORED TO THEIR SPECIFIC NEEDS.**

These examples show how social protection can promote youth resilience by enhancing enabling factors, such as education outcomes, skills development, labour market participation, entrepreneurship asset accumulation and agricultural productivity. However, to maximize the impact of social protection for youth, it is essential to integrate specific components that address youth needs, such as training, business development and climate-resilient agriculture, and to adopt a long-term perspective that considers benefits adequacy and sustainability.

© FAO/SANJA KNEŽEVIĆ
IN SMEDEREVO, SERBIA, MARIJA STOJILJKOVIĆ GROWS CUCUMBER IN HER GREENHOUSE.

INCREASING YOUTH VOICE AND AGENCY

In recent decades, the value of involving youth in policy dialogues has been increasingly acknowledged, yet their participation in agrifood systems decision-making is still constrained, as highlighted in Chapter 3. Barriers to meaningful youth engagement include limited training, restrictive social and legal norms, inadequate funding and logistical support, under–representation and tokenism in global forums. Rural and marginalized youth face additional challenges, such as exclusion from institutional platforms, economic pressures and gender bias.[139–141] While digital technologies have the potential to open up new spaces for youth engagement, connectivity gaps, lower smartphone ownership and limited digital literacy in remote rural areas remain major obstacles to meaningful youth inclusion, particularly for young women (see Chapter 3).[142, 143] Initiatives have been undertaken to foster youth inclusion in decision-making, however many of these lack rigorous assessment, although some promising approaches have emerged.

PROMOTE INCLUSIVE COLLECTIVE ACTION

For vulnerable or more disadvantaged youth, collective action often proves more effective than individual action in exercising agency.[144, 145] By joining or forming groups, whether through formal producers' organizations, cooperatives and community-based organizations, or more informal networks and associations, young people can pool resources, expand their influence and navigate power relations more effectively.[146–148] Membership in formal or informal collectives can grant rural youth greater visibility in policymaking for agrifood systems. This impact can be seen in youth-driven networks in Colombia, Rwanda and Uganda, all of which have contributed to shaping national development strategies and policies.[149, 150] Apex organizations, like the Asian Farmers Association for Sustainable Rural Development (AFA), have also made efforts to include youth.

Despite efforts by cooperatives, rural institutions and apex organizations to empower young farmers and promote their leadership, young people still encounter a variety of obstacles in attempts to harness collective action through formal rural organizations. Membership criteria such as land ownership or fees may exclude those reliant on small family parcels, although some cooperatives and producers' organizations have tried to mitigate land-access barriers by allowing families to use

> "YOUTH COLLECTIVE ACTION THROUGH COOPERATIVES AND YOUTH ORGANIZATIONS OFTEN PROVES MORE EFFECTIVE THAN INDIVIDUAL EFFORTS IN EXERCISING AGENCY.

shared land as collateral.[152] Mistrust and scepticism about collective initiatives, as well as inadequate organizational skills, often lead youth to work in isolation rather than forming or joining groups.[146, 151, 153–155] In the context of agrifood systems and particularly in rural settings, youth-led networks frequently lack cohesive leadership and robust organizational frameworks, which may result in top-down structures and limited engagement of under–represented groups (e.g. young women, youth with disabilities, those under 18, Indigenous youth, migrants, refugees, IDPs).[154] For example, a recent mapping of African youth organizations working in agricultural development and climate change reveals persistent gender disparities in leadership positions.[156] Removing entry barriers and strengthening these organizations' capacity to adopt transformative, intersectional and socially inclusive approaches can make them more equitable and effective.[151–153]

STRENGTHEN SOCIAL CAPITAL

Exercising agency means acquiring the knowledge, skills and capabilities needed to envision valued goals or futures, and to pursue them through free and informed decision making.[157, 158] In rural settings, these competencies are not always provided by existing education systems. Investing in both the human and social capital of young people is paramount to elevating their voices, especially in the public sphere.

Strategies such as peer-to-peer exchanges and learning that harness common group identity, as well as personal initiative training sessions, have proven to be effective in strengthening youth agency, cultivating new skills and fostering proactive entrepreneurial mindsets.[159–161] Youth individual and group agency in agrifood systems is significantly boosted by young "champions" as well as by youth-led organizations and networks, as seen in the examples of networks in Uganda and Senegal.[162, 163] Furthermore, relational approaches that strengthen intergenerational collaboration in the family or the local community, such as mentorship, role models or broader youth-adult partnership approaches,[163–165] can play a powerful role in smoothing the transfer of resources across generations, preserving traditional knowledge and culture, and building youth life skills and social networks.

Strengthening youth capacity and leadership also helps to challenge discriminatory norms and empower young people to meaningfully shape the future of their rural communities. For example, community-led gender-transformative initiatives, such as FAO's *Dimitra Clubs*,[166] have had a visible impact on the quality of life of young women and men, strengthening their leadership and self-development skills.[167] Similar participatory approaches that encourage young people to analyse and address local issues have successfully boosted the agency of youth, particularly girls, by fostering critical thinking and communication skills. For instance, in rural Malawi, youth-led *Reflection-Action Circles* facilitated by Action Aid have successfully addressed issues such as discrimination against youth with disabilities, securing commitments from local leaders to improve access to education,[167] and advocated for youth inclusion in governance. Similarly, Tostan's *Community Empowerment Program*[167] successfully stimulated community dialogue and action on female genital mutilation, child marriage and gender equality, achieving a comprehensive shift in attitudes and behaviours across over 7 200 rural communities in sub-Saharan Africa.

PROMOTE INTER-GENERATIONAL RENEWAL, PARTICULARLY IN LABOUR-SCARCE SETTINGS

Given that power dynamics between generations can constrain youth agency and resource access, policies that promote intergenerational transfer or renewal of agrifood systems employment are critical. Such policies are particularly important in countries where youth populations are low or declining. This section examines experiences and lessons learned from policy approaches working to address these concerns, the majority of which come from industrialized agrifood systems in Asia or Europe.

Issues of land access and land succession affecting predominantly young people have been an important focus of policies fostering generational renewal in agriculture, particularly in Europe. However, the evidence shows that programmes addressing this challenge have not yielded strong positive results. For example, the Fresh Start Initiative, implemented in the United Kingdom of Great Britain and Northern Ireland, was designed as a matchmaking facility to help identify and facilitate joint venture agreements between older farmers and new

entrants. However, the programme failed to successfully generate new joint venture arrangements because of wide variance in motivations and expectations between older farmers and new entrants, as well as concerns regarding their respective responsibilities in working relationships.[168] Similarly, an evaluation of the European farmers' early retirement scheme, which sought to incentivize farmers between the ages of 55 and 66 to retire and transfer their land to younger farmers, found only a minimal impact on the age structure of European farmers, and failed to encourage new entrants into farming.[169] In most of the cases, transfers that occurred under the programme were between members of the same family.

Financial incentives to encourage the entry of young people into farming have also yielded mixed results. The Young Farmer Payment, which provides financial support to farmers under the age of 40 through Europe's Common Agricultural Policy, was found to support intergenerational succession of farms by addressing capitalization and financial constraints faced by farm successors, but proved insufficient to support the establishment of new farming businesses by young entrants.[170] In contrast, the Setting up Aid (SUA) scheme under Europe's Rural Development Programme successfully fostered the transition of young hired farmers to farm managers, while increasing income from farming and farm survival in Sweden.[171] The success of the SUA compared to the Young Farmer Payment scheme is attributed to two factors: the requirement to submit a farm business plan, which obliges participants to deliberate on the future development of their farm, and the larger lump sum transfer provided by SUA, which proved more effective than the smaller payments spread over five years offered by the Young Farmer Payment scheme.

Young farmer payment schemes and policies designed to financially incentivize farm succession may underperform because they fail to engage with social and psychological factors that drive young people to enter farming or older farmers to leave. A study in the United Kingdom of Great Britain and Northern Ireland found that payments had little influence on older farmers' willingness to exit. Instead, factors such as involvement in farm management, a good understanding of the farm's situation, and strong social identification with farming fostered through family and social ties to agriculture, were more influential in promoting the entry of young farmers.[172] To improve the impact of these payment schemes, complementary actions are needed to facilitate young farmers' integration into the farm business, promote more positive perceptions of farming as an occupation, and strengthen the integration of young people into farm communities.[172]

Support for modernization and the use of modern farming technologies can help overturn perceptions of farming as a lower-status occupation and attract young people to the sector. In Ireland, for example, the uptake of innovative practices improved farm viability and encouraged the next generation of young farmers to consider farming as a long-term occupation.[173] Similarly, in Spain, lack of modernization was identified as a key barrier to generational change in the sector.[174] The promotion of technological advancement among both older and younger farmers thus has the potential to both attract and maintain young people in agriculture.[175]

Additionally, the development of niche and specialty markets (e.g. organic and direct marketing systems) and farm diversification (including agrotourism) both contribute to driving young people's entry into agriculture.[173, 176, 177] These farming systems can help boost economic returns and reduce the uncertainty of agricultural livelihoods, while also aligning with social and environmental concerns held by many young farmers.[32, 175]

In labour-scarce settings, agrifood systems increasingly rely on migrant workers, including youth, to address labour shortages, particularly where labour-intensive crops and food processing and distribution are concerned.[178] Bilateral Labour Migration Agreements (BLMAs) and Seasonal Migration Schemes facilitate the mobility of agricultural workers,[179] and have been adopted in several countries,[180, 181] including the United States of America,[182] Canada,[183] Australia,[184] New Zealand,[185] the Republic of Korea[186] and the European Union.[187] While evidence on their impact is scarce, New Zealand's Recognised Seasonal Employer scheme has shown positive impacts. The scheme aims at easing labour shortages in horticulture and viticulture by accepting foreign workers, in particular from Pacific countries.[185] The programme has increased incomes and consumption among households in countries of origin, with other notable impacts including a rise in school attendance rates by 20 percentage points for 16–18 year olds in Tonga.[188]

ENHANCING YOUTH SKILLS

Knowledge and skills profoundly influence the nature of youth engagement in agrifood systems and determine their potential contributions to agrifood systems transformation. Improved skills levels expand youth employability, boost earning potential, facilitate entrepreneurship and improve productivity – whether in farming or off-farm activities.[8,154] Skilled youth are also better positioned to access vital resources such as land, credit and technology, enhancing their competitiveness while fostering valuable networks to share knowledge and influence policy.[189, 190] Entrepreneurship thrives when young people possess specialized skills to innovate, develop new products in response to changing consumer demands and ultimately stimulate local economies. [191–193] As the agricultural sector contends with technological changes, shifting markets and environmental concerns, having a skilled workforce is pivotal to sustaining food security and economic stability.

Reflecting this priority, skills development dominates youth-focused labour market programmes,[194, 195] representing more than half of interventions in a recent large-scale meta-analysis of youth-focused active labour market interventions.[194, 196] Lessons from these programmes points to some design elements, successful methods, and areas of investment for delivering skills and training and enhancing education in rural areas or among agrifood system workers.

ENHANCE SKILLS TRAINING THROUGH PRACTICAL, CONTEXT-RELEVANT AND MARKET-ALIGNED APPROACHES

Programmes aimed at building youth-relevant skills for agrifood systems vary considerably in their content, duration, delivery methods and target population. Their focus can range from technical agricultural knowledge to business acumen and soft skills, with training lengths spanning brief workshops to multi-month courses.[195, 197] Delivery methods include in-person sessions, online courses and hands-on learning, often supplemented by mentorship. Some programmes are integrated into formal education at both the secondary and tertiary levels,[148, 198] and may target a wide array of youth groups (e.g. rural and urban youth, young women or marginalized communities), sometimes incorporating additional services like financing or market access to overcome broader barriers.[199]

The effectiveness of these skills training programmes varies significantly according to their design and implementation, the local context and the specific needs of participants. Although a complete understanding of what works best across different settings and objectives is still evolving, certain design features consistently emerge in successful initiatives. First, programmes that combine various skill sets with complementary support services such as mentorship, market linkages and access to resources tend to deliver better employment outcomes.[9, 148, 200] Such a comprehensive perspective fosters a deeper appreciation of how different components of agrifood systems intersect, empowering youth to either create their own opportunities or seek employment in existing ventures.[194, 195]

Second, programmatic models that emphasize hands-on, practical activities – such as internships, apprenticeships, fieldwork and project-based tasks – allow young participants to apply their newly acquired skills in real-world conditions and improve their employability.[154, 201, 202] These experiential learning processes reinforce theoretical understanding, bolster confidence and facilitate networking with professionals, all of which are essential for sustained career growth. To further address challenges with skills mismatch (see Chapter 3), the literature emphasizes the importance of strengthening linkages between youth skills development programmes and employers. Such collaborations can

help identify concrete skill gaps[201] and ensure that these insights are systematically fed back into education and training systems to make them more responsive to labour market demands.

Third, initiatives that tailor their content and structure to a specific economic and social environment are better positioned to succeed.[28, 159] In regions with high demand for particular skills, targeted training can result in measurable improvements in labour outcomes, whereas in areas with limited opportunities or mismatched training, the impact may be negligible.[203] Furthermore, programmes that address intersectional factors, such as gender, socioeconomic background and cultural context, are more likely to engage participants effectively.[194] By ensuring that training aligns with local market needs and addresses the realities of target youth populations, such interventions increase the likelihood of positive employment outcomes and, consequently, contribute to wider economic advancement.[194]

In addition, peer-to-peer approaches in agrifood systems-related training can enhance the effectiveness of skills development and complement more formal training programmes or extension services, while helping to building social capital and youth agency. Such approaches leverage social learning and peer influence,[160] demonstrably improve the overall performance of agripreneurship initiatives,[159] and are among the most appreciated components by youth within entrepreneurship initiatives supported in multiple countries.[149, 204]

STRENGTHEN EDUCATION IN AGRIFOOD SYSTEMS

Substantial and long-term public investments in education are needed to ensure equitable access to high-quality learning, to enable the development of skills demanded by rapidly changing agrifood systems. Such investments should prioritize the modernization of educational curricula to reflect current labour market conditions and the specialized competencies required in agrifood systems. This is particularly important in lower-income countries, where youth populations are large and agrifood systems constitute a key economic pillar.[209] Given the lack of access to secondary education in less transitioned agrifood systems and in rural areas, as highlighted in Chapter 3, incorporating agrifood systems-relevant skills early, ideally at the primary school level, can expose students to practical agrifood systems-related knowledge. For example, in Mozambique, Junior Farmer Field and Life Schools have successfully integrated farming and life skills into the primary school curriculum.[210] Such early exposure to agrifood system-related knowledge has been shown to spark children's interest in agrifood systems careers and contribute to nurturing a generation of well-informed, skilled practitioners.[204]

Much employment across agrifood systems roles relies on foundational literacy, numeracy and problem-solving abilities, which could be acquired without a university education.[211] Nevertheless, investments at the university level are vital for spurring innovation and productivity, and increasing the supply of researchers, practitioners and trainers, who may directly train youth and shape the quality of training that young people receive. Agricultural universities play a pivotal role in the research and development of improved breeding methods, agronomic practices and cutting-edge food technologies. In the United States of America, for instance, land-grant universities have historically driven major breakthroughs in agricultural productivity while developing a skilled workforce to power the agrifoods industry.[212] Universities are also increasingly driving digital innovation in agriculture by providing young entrepreneurs with tools, mentorship and platforms. In India, universities have launched digital agriculture R&D programmes, incubating startups like *HarSar farmAR*, which provides an immersive virtual farm experience. Similarly, Rwanda's *kLab* innovation hub supports youth-led, ICT-driven agricultural solutions by connecting young entrepreneurs with farmers to address real-world agricultural challenges.[154, 213] Similar investments are needed elsewhere to nurture a critical mass of innovators who can design sustainable solutions for the pressing challenges facing agrifood systems.

While long-term investment in education remains essential, immediate opportunities for engaging youth often come through expanded access to high-quality Technical and Vocational Education and Training (TVET) – formal education that provides practical skills and knowledge for specific trades and prepares individuals for the workforce through hands-on-training. However, the data on the impacts of TVET on employment outcomes is mixed. While TVET facilitates the school-to-work transition for youth, labour market outcomes over time are often higher for those with general education, even after accounting for individual characteristics.[214]

This is in part due to the generally low effectiveness of TVET systems, particularly in low- and middle-income countries.[214] Traditional TVET systems focus on equipping youth with specific technical skills to facilitate their entry into a particular occupation, but do not usually strengthen adaptability, job mobility or increased productivity over the life cycle, especially in contexts of rapid technological and economic change.[215, 216] Agricultural TVET programmes, in particular, have been criticized for an overly theoretical focus and insufficient emphasis on entrepreneurship and business skills.[217, 218] Moreover, TVET offerings in many developing countries, particularly in rural areas, are often underfunded, carry a stigma of being "less professional" or fail to align curricula with labour market needs.[27, 214, 219]

Addressing these gaps by updating TVET curricula to include cutting-edge agricultural and climate-smart practices – as well as the latest agribusiness technologies – could greatly improve job and self-employment prospects for low-skilled youth in agrifood systems.[214] A recent review shows that incorporating modern technologies, such as drones, GPS and AI-based platforms into educational modules at TVET institutions, alongside agricultural entrepreneurial skills training, significantly improved students' decision-making abilities and their readiness to pursue entrepreneurial opportunities in agriculture.[220]

EXPAND YOUTH ACCESS TO RURAL ADVISORY SERVICES AND AGRIBUSINESS TRAINING

Expanding skill training opportunities for youth, particularly those outside the formal education system, is essential for youth engagement in agrifood systems. Rural advisory services (RAS) provide information and support to producers and other economic participants in agrifood systems and play a key role in improving livelihoods and developing technical, organizational and management skills and practices.[221, 222] These services, which include market information, financial guidance and agribusiness training are often provided by a variety of public, private, NGO and cooperative institutions.[223] To be effective, rural advisory services must be adapted to changing economic, social and environmental conditions, the demands of today's agrifood systems and the specific needs of youth.[224]

©VISIONTIME/MELANIE BOUTROS
IN CHISINAU, MOLDOVA, A TVET TRAINEE PRACTICES PRECISION IN A FOOD-PROCESSING WORKSHOP, ARRANGING EMPTY JARS ON A CONVEYOR BELT—AN EXAMPLE OF HOW HANDS-ON VOCATIONAL TRAINING OPENS NON-FARM AGRIFOOD CAREER PATHWAYS FOR YOUTH.

Agricultural policies are increasingly prioritizing youth involvement in extension services, both as beneficiaries and providers.[207] In Pakistan, engaging youth in extension and advisory services helped to disseminate knowledge and promote sustainable and climate-smart farming practices.[208] Similarly, innovative platforms like Shamba Shape Up in East Africa and Digital Green in India involve youth in producing television and community-led video content, which helps to overcome informational barriers to agricultural productivity.[205, 206] Scaling these initiatives in ways that reflect young people's preferences, circumstances and evolving needs in modern agrifood systems could significantly expand youth engagement in agrifood systems.

The integration of ICTs has transformed the delivery of rural advisory services, particularly in sub-Saharan Africa.[225] Such services, which make use of mobile applications and digital platforms, often involve youth serving as village-based digital advisors and agricultural extension service providers. Digital platforms like *E-Vuna* and *MyAgro*, which actively engage with youth, have created employment opportunities for young people and strengthened rural advisory services, while making their advice more relevant and practical.[213] The provision of technical information via mobile phone has also been shown to improve yields and increase the adoption of agricultural practices.[226] Nonetheless, challenges with the accessibility and affordability of digital technologies need to be addressed to make them inclusive of vulnerable youth groups and maximize their impact.[227, 163]

Agribusiness training programmes and incubation hubs have emerged as a potentially effective strategy among various labour market interventions.[228] These platforms encourage innovation by helping youth to develop and test business ideas within a supportive environment, providing technical and business training, and linking youth to markets, resources and new technologies. Youth-centred incubators that supply resources, mentorship and networks have yielded significant gains in skills, income and job creation.[199, 230] Furthermore, research in this field highlights the greater impacts of approaches that focus on personal initiative or action-oriented mindset change in agripreneurship training compared to traditional business training.[159, 229]

Yet, access to these kinds of opportunities remains limited, particularly for marginalized youth, due to geographical, financial and institutional barriers such as strict eligibility requirements. Strategically placed rural incubation

> "YOUTH-CENTERED INCUBATORS PROVIDING RESOURCES, MENTORSHIP, AND NETWORKS HAVE SIGNIFICANTLY BOOSTED SKILLS, INCOME, AND JOB CREATION.

hubs and intentional targeting of marginalized youth[231] coupled with reduced financial and structural barriers could help close the skills gap. Similarly, the adoption of a network approach leveraging and connecting existing service providers and institutions would favour youth access to an array of integrated services spanning extension, business advisory and finance. This incubation approach, known as "without walls", may prove a cost-efficient and sustainable solution.[231, 232] Incorporating low-bandwidth digital approaches – such as mobile apps or online platforms for agribusiness courses and market information – can further enhance these efforts, especially for remote youth without sufficient digital access.[233]

While agribusiness training and incubators enhance entrepreneurial mindsets and skills, there is limited likelihood that youth beneficiaries will create viable enterprises immediately. Research shows that most successful job-creating businesses are led by those aged over 25, as younger individuals often face additional constraints in terms of experience, resources and networks.[25, 26] In challenging economic contexts, youth may establish necessity-based ventures which are often prone to low productivity and limited growth.[26] As a result, programmes and policies need a broader scope, addressing financial, educational and regulatory hurdles instead of simply encouraging entrepreneurship. Long-term incubator programmes offering sustained capacity building, mentorship and technical training, and startup financial support yield positive effects on both employment and earnings.[25, 199, 148]

EXPANDING YOUTH ACCESS TO RESOURCES

Enhancing youth access to essential productive resources such as land, finance and digital technology, as well as markets, is crucial for their meaningful participation in agrifood systems. As discussed in Chapter 3, rural youth encounter a range of structural, financial, legal and social barriers that hinder their ability to access these vital resources. Improving young people's access to productive resources requires a combination of targeted interventions that address these constraints. A number of promising approaches and areas of investment effectively enhance access to various resources and improve youth engagement and outcomes in agrifood systems.

ADDRESS YOUTH RESOURCE ACCESS CONSTRAINTS USING AN INTEGRATED APPROACH

Evidence suggests that resource access interventions targeting youth combined with other types of support achieve better effects than resource access alone.[234, 238] For example, financial exclusion should be addressed in combination with other forms of asset and resource gaps affecting youth. Common approaches combine skills training with access to finance and/or agricultural inputs.[234–236, 239] One programme in India offered training in agricultural practices to rural youth not in education, employment or training (NEET). Upon completion, participants received agricultural inputs (animal feed and poultry chicks) that enabled them to launch or improve their agribusinesses. This intervention led to increased job creation and reduced distress migration.[234]

A recent World Bank study confirms that well-designed economic inclusion programmes can yield considerable benefits for vulnerable or more disadvantaged populations, including youth.[240] However, scaling such integrated programmes often demands significant investment, with several of the most successful resource-access initiatives embedded in national government-led programmes.[235, 239, 237] Scaling-up also requires changes in how market systems work, so that youth can benefit from more accessible business models. However, market-based approaches to improving youth resource access require careful design, as the pursuit of higher profitability can lead to unintended consequences for vulnerable or more disadvantaged groups. For example, in Mozambique, a project that partnered with the private sector to enhance access to certified seeds inadvertently intensified land competition, resulting in the consolidation of land control among household heads while marginalizing women and perpetuating the exclusion of youth.[241] Ignoring how markets function and the potential distortions that interventions can generate can be counterproductive. In a case in Uganda, an initiative that offered agricultural input subsidies to youth faced high demand, straining market supply and creating market tensions.[242]

PROMOTE INCLUSIVE POLICIES THAT ADDRESS RESOURCE GAPS

Promising resource access interventions are often rooted in policies that explicitly recognize and prioritize the needs of youth and other vulnerable

groups. These include redistributive reforms aimed at redressing power and resource imbalances between older and younger generations without compromising the legitimate needs of the elderly.[163, 243]

Issues related to land titling and secure tenure rights highlight the central role of national policies in supporting youth engagement in the sector. A recent study from the United Republic of Tanzania found that land titling and inclusive reforms introduced since the 1990s have encouraged greater youth involvement in agriculture.[244] Additional research highlights the importance of facilitating farm succession as a key to youth entry into farming while simultaneously addressing persisting gender-discriminatory social norms favouring male-line succession.[245] An assessment in Ethiopia documented land formalization programmes that integrate gender- and age-sensitive parameters to protect intra-household rights and foster inclusive access to land that benefits youth.[249] Nonetheless, the possible pitfalls of land formalization initiatives seeking to improve the land rights of youth and other vulnerable groups should be considered in each given context, given the ample evidence[246–248] of the potential risk of increased conflict between different stakeholders, including individuals within communities.

Other important mechanisms for facilitating access to agricultural land for young people – particularly those from households with little or no land – include the development of land rental markets, the rehabilitation of abandoned plots, and the allocation of unused communal or public land. Evidence from Ethiopia shows that rental markets have successfully facilitated land access for landless and near-landless youth. However, over 90 percent of the land rental contracts were established for sharecropping, reflecting young people's limited access to cash and the high perceived risks of agriculture.[250] Access to rental land is also essential in Europe, where agricultural land for purchase is often scarce and expensive.[251] Rental arrangements are often informal in nature which may increase precarity and disincentivize investment in land, limiting agricultural productivity over the long term.[251] These arrangements can also be exploitive if young people have few other options.[252] Young women are less likely to be able to access land through rental markets,[250, 251] pointing to the need for gender-responsive complementary interventions to overcome the barriers they face. Meanwhile, initiatives focused on the rehabilitation of abandoned land or the allocation of unused communal or public lands have facilitated youth access to land across diverse contexts, including in Burkina Faso, Egypt,[253] Ethiopia, Italy[254] and Mexico.

Governments must carefully consider how agricultural and other policies affect the rights and interests of young people and future generations. For example, land reforms have historically excluded women and youth.[253] Additionally, agricultural policies such as subsidies can reduce farmers' incentives to transfer land either through sales of bequests.[251] Inadequate old-age social protection benefits among agricultural populations can further reduce intergenerational transfers of land.[256, 257]

When governments integrate and mainstream youth considerations into national agricultural policies, they can directly address youth-specific challenges and support more equitable access to productive resources for inclusive agrifood systems.[243] Indeed, many global,[258–261] regional[262, 263] and national policies mainstream youth as a target demographic. FAO's analysis of 82 countries indicates that the majority of national agricultural strategies reviewed (71 percent) incorporate youth into their objectives, activities and performance indicators (see Box 7.2). However, to ensure that policies genuinely facilitate equitable resource access, national governments must not only endorse policies but also demonstrate a commitment to effective implementation. This includes providing education and awareness around rights to resources, which can empower youth to navigate and advocate for their rights effectively.

LEVERAGE COLLECTIVE ACTION TO EXPAND RESOURCE ACCESS

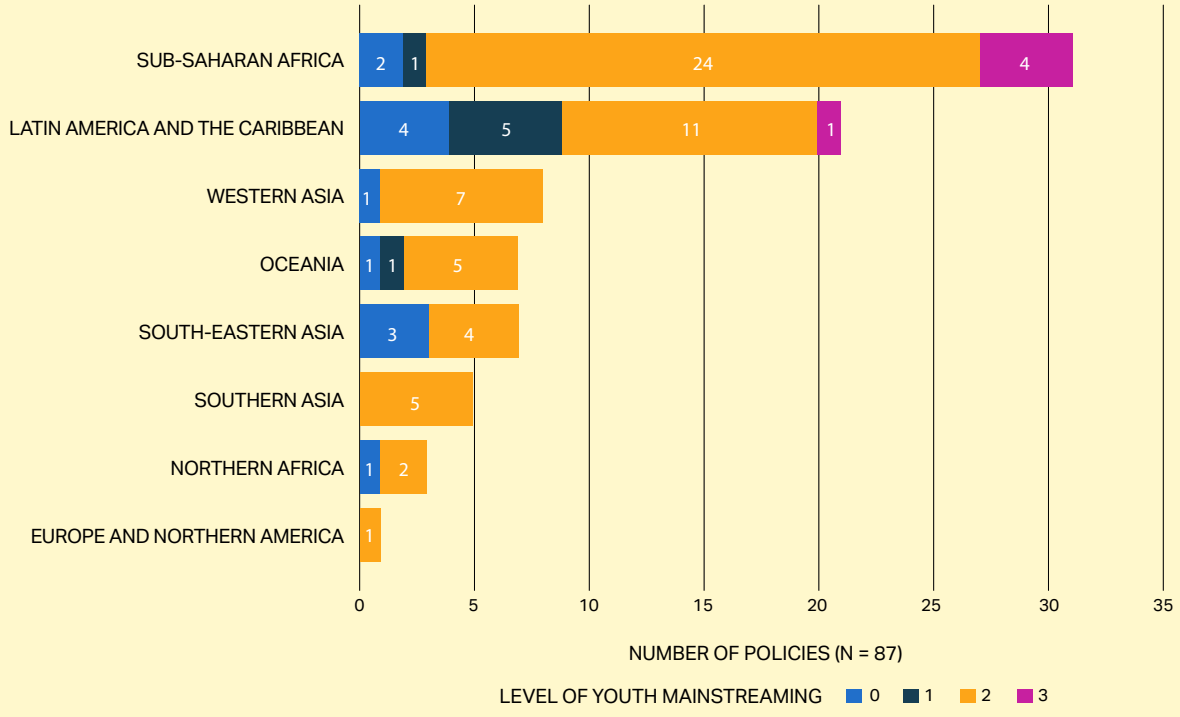
Collective action can enhance youth access to resources.[264] Beyond economic and financial benefits, cooperatives provide essential services that support youth, including informal emergency funds, savings and credit programmes, and risk-sharing mechanisms. Youth organizations can strengthen collective agency and engage in lobbying the government to safeguard young people's land rights,[254] for example by establishing youth quotas in land management institutions to amplify young people's voice and influence in decisions that affect their future access to land.[254] Additionally, facilitating access to financial resources, such as low-

BOX 7.2 YOUTH MAINSTREAMING IN NATIONAL AGRICULTURAL POLICIES

FAO's analysis of agricultural policies and strategies shows that youth are relatively well-integrated as a target group into most policies. The policies analysed were drawn from the FAOLEX Database and the FAO Decent Rural Employment (DRE) Policy Database.[i] Out of 116 countries with available policy documents, 87 written in English, French, Portuguese and Spanish, from 82 lower-income countries, were retained for analysis.

The selected policies were ranked using a four-point scale (0–3) in accordance with their level of youth mainstreaming (see Figure A). Level 0 indicated that youth were either not mentioned or referenced only once or twice in relation to minor activities. Level 1 policies recognized youth as a target or priority group, but without specific results, indicators, or activities. Level 2 policies included youth-specific results, activities and/or indicators, demonstrating a more focused approach to addressing youth issues. Level 3 represents the highest level of youth mainstreaming, going beyond Level 2 criteria to include dedicated strategies for youth in agriculture or agribusiness. While this focus on policy formulation excludes any assessment of implementation – a possible limitation – the policy discourse is a good indicator of government commitments towards youth.

FIGURE A. YOUTH INTEGRATION IN AGRICULTURAL POLICIES SHOWS REGIONAL VARIATION



Source: Author's own elaboration.

BOX 7.2 YOUTH MAINSTREAMING IN NATIONAL AGRICULTURAL POLICIES

Most countries (71 percent) were categorized as level 2, indicating meaningful mainstreaming of youth through specific activities and outcomes. About 6 percent achieved a level 3 classification, having a dedicated policy for youth in agriculture, along with well-integrated youth aspirations and concerns in broader policies. Conversely, 13 percent of countries were assessed as level 0, indicating either minimal or no mention of youth.

Regional variations exist in the level of youth mainstreaming. Generally, youth mainstreaming was strongest in Africa, probably as a reflection of long-term regional commitments on youth. The starting point was the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods, which made a concrete commitment "to create job opportunities for at least 30 percent of the youth in agricultural value chains". More recently, the 2022 African Agribusiness Youth Strategy urged countries to integrate specific elements on youth agribusiness building into existing agriculture and/or youth policies.[ii] Countries such as Kenya, Rwanda, Uganda and the United Republic of Tanzania are notable for their youth-specific strategies and high levels of youth mainstreaming in policy. Outside Africa, a few countries such as Fiji and Jamaica have also established dedicated strategies targeting youth integration in agriculture.

In comparison, youth integration is less evident or explicit in agricultural policies for Southeast Asia and Latin America and the Caribbean. In both regions, multiple countries fall into the level 0 category, although in some cases ministries of agriculture have begun to develop rural youth policies. A more mixed level of integration was found in other regions, such as the rest of Asia and Oceania.

A more granular analysis focused on African countries revealed that some policy areas are still overlooked. These areas include youth-friendly enabling environments (integrating youth participation and rights) as well as innovation. In comparison, aspects relating to livelihoods, access to resources, skills, entrepreneurship, TVET and financial literacy are more commonly addressed. Areas never covered include formalization, job matching, occupational safety and health, intergenerational transfer of land and succession planning, youth engagement in public procurement, digital connectivity dimensions and data protection. Areas very rarely covered include youth rights, diversity and representation in policy making, labour rights violations, labour laws and wages, mentorship and peer-to-peer approaches, youth-led research, soft skills and leadership, youth-centred social protection interventions, education programmes, data collection to enhance the reflection of youth needs and intra-generational transfer of knowledge including Indigenous knowledge.

Notes: Refer to the Notes section for full citations.

interest loans and grants, will enable these cooperatives to offer critical services such as emergency funds and savings programmes.[264] Cooperatives also facilitate access to vital resources such as retailers, health services, transportation and digital tools.[265–267] Participation in these organizations enables youth members to influence the types of services offered and the terms under which they are provided, and fosters a sense of belonging and community.[265–267] Capacity-building programmes focusing on cooperative management and financial literacy can also boost the collective power of youth-oriented cooperatives. By encouraging partnerships between cooperatives and service providers, policymakers can ensure that these organizations effectively tackle the unique challenges faced by rural youth, ultimately contributing to their empowerment and resilience.

© **FAO/STUART TIBAWESWA** IN MUKONO, UGANDA, SIMON WAMBEDDE HARVESTS MULBERRY LEAVES FROM HIS THREE-ACRE PLANTATION TO FEED SILKWORMS,

HARNESS DIGITAL TECHNOLOGIES TO ACCELERATE PROGRESS

Agrifood systems present diverse opportunities to leverage digital technologies to create jobs and make agrifood systems more appealing to youth.[268, 269] Several proven strategies and models have successfully increased youth participation in digital agriculture.

Mobile technology has become a key enabler of digital solutions, integrating financial and non-financial services for young farmers. In sub-Saharan Africa, over half of the Digitalization for Agriculture (D4Ag) platforms[k] bundle multiple services like market access and financial tools into scalable digital ecosystems.[270] Research shows that bundled services within one-stop digital marketplaces are the most effective FinTech solution for young agripreneurs, increasing efficiency and reducing costs.[270] As an example, *Agrikore*, a blockchain-powered e-commerce platform, developed by *Cellulant*, links farmers, processors, traders and logistics companies in ways that ensure transparency, trust and efficiency in agricultural transactions.[271]

Youth-led FinTech startups are also improving access finance by offering digital credit, insurance and investment solutions tailored to young farmers and agriprenuers. *FarmCrowdy*, a youth-led Nigerian-based crowdfunding platform, enables individuals to invest in crop and livestock production cycles and has expanded into input and equipment financing, digital insurance and market aggregation services. It also identifies and trains young entrepreneurs to manage tech-enabled farm product aggregation[272, 273] Similarly, *ThriveAgic* provides youth-friendly financial solutions such as loans backed by digital collateral and weather-indexed crop insurance, aligning repayment with agricultural cash flow cycles, allowing farmers to repay loans post-harvest.[272]

k Digitalization for agriculture (D4Ag) platforms integrate digital technologies, innovations and data to enhance productivity, market access, financial inclusion and sustainability of agricultural value chains. It includes tools and services such as mobile applications, digital advisory services, e-commerce platforms, precision farming technologies and data analytics.

WAY FORWARD TOWARDS YOUTH-INCLUSIVE AGRIFOOD SYSTEMS

Youth-inclusive agrifood systems that provide decent jobs, healthy diets and food security, while bolstering resilience, are both achievable and vital to addressing the challenges faced by today's young people. Realizing this vision, however, requires robust commitments from diverse stakeholders and a multifaceted approach across research, policy and investment tailored to the varying contexts in which youth live. This report has provided a comprehensive assessment of the evidence to date on youth engagement in agrifood systems and highlighted key approaches and areas of investment that improve youth engagement and outcomes in agrifood systems. While acknowledging the progress made, more is needed to sustain and scale the impacts of ongoing efforts towards youth-inclusive agrifood systems. Specifically, there is a need to inquire more, include more, and invest more:

> **"YOUTH-INCLUSIVE AGRIFOOD TRANSFORMATION DEMANDS STRONG STAKEHOLDER COMMITMENTS, ROBUST EVIDENCE, INCLUSIVE VOICES, AND TARGETED INVESTMENT.**

- Inquire more means bridging knowledge and data gaps and strengthening the evidence for youth inclusive agrifood systems.
- Include more means amplifying the voices of diverse youth in policy and decision-making processes to ensure that agrifood systems transformation reflects their needs and realities.
- Invest more means driving structural change and targeted investments to expand economic opportunities for youth and empower them to fully participate in and benefit from agrifood systems transformation.

INQUIRE MORE – STRENGTHENING EVIDENCE FOR YOUTH-INCLUSIVE AGRIFOOD SYSTEMS

Youth challenges in agrifood systems are complex, dynamic and deeply rooted in structural and sociocultural factors that vary across context.[274, 275] Hence, it is essential for policies and programmes to be evidence-based, adaptive and responsive to youth realities. However, despite progress in recent decades, critical data and research gaps persist, limiting effective youth-focused interventions.

To bridge this gap, there is a need for more systematic data collection and actionable research to capture youth realities in agrifood systems, including their employment status, working conditions, food security and nutritional intake, and access to services, assets and social protection. While initiatives such as the Living Standard Measurement Study (LSMS)[276] have improved age-disaggregated data, coverage remains limited, especially for marginalized youth, including Indigenous youth, migrants and persons with disability, as well as for under-represented agrifood systems sub-sectors like fisheries and forestry. Moreover, the tendency of these surveys to focus on heads of households, most of whom are not young, limits their usefulness for youth-focused analysis. Longitudinal data necessary to identify causal drivers of change are relatively scarce. Expanding these efforts to a broad range of countries and youth subgroups is therefore crucial for informed policymaking. The existence of varying age-based definitions of youth[262, 277] poses an additional challenge for data comparability and interpretation. Similarly, while digitally enabled agricultural services are extensively documented,[278] high-quality empirical data on the actual adoption and outcomes are limited, leaving significant gaps in the understanding of how digital solutions impact youth engagement.

Beyond data, research on policy and programme effectiveness is lacking. Most evaluations of agrifood policies focus on public expenditures[279] rather than youth-specific impacts,[280] and cost-effectiveness analyses of interventions are rare.[201] Additionally, a key step in advancing broad-based productivity is to invest in R&D and robust extension systems that enable a two-way flow of information between researchers and agrifood systems' end users. By generating context-specific knowledge, developing innovative technologies and ensuring their effective dissemination, these initiatives can address a spectrum of challenges – including climate-related threats – while boosting productivity across diverse local settings.[16, 17] Additionally, policies and strategies often bridge adolescence to women of reproductive age, including youth, but only rarely tailor interventions specifically for them. Lastly, ensuring healthy diets within agrifood systems transformation requires better data on youth dietary patterns to inform policies and strategies.

To drive meaningful change, youth-specific policy monitoring and evaluation mechanisms need to be established. Closing data and research gaps will enable the development of evidence-driven policies and the scaling up of successful models to improve youth livelihoods in agrifood systems.

INCLUDE MORE – INVOLVING YOUTH IN POLICYMAKING

Young people are the ultimate experts of their own reality, and their voices must be more actively integrated into policymaking to ensure that policies and programmes reflect their needs and lived experiences. Moving beyond tokenism, youth inclusion requires policies and governance structures that are developed with youth, not just for them.

As discussed in Box 7.2, significant progress has been made in mainstreaming youth in agricultural policies. Yet, major gaps remain related to policy implementation coherence and diversification to address the heterogeneity of youth. Ensuring meaningful youth inclusion demands stronger policy implementation and coherence across sectors, including social protection, financial inclusion, land tenure, employment, education, innovation and climate change. Governments must not only endorse youth-inclusive policies and recommendations that emerge from youth consultative processes but also commit to their effective implementation. Globally, millions of youth work in agrifood systems under unsafe conditions with little to no labour protection and social security. Strengthening legal frameworks to uphold youth labour rights and occupational safety standards to ensure decent employment is crucial. Finally, policies must uphold the human rights of all young people, align with global human rights frameworks, and ensure equity regardless of gender, socioeconomic status or background.[102]

Additionally, institutions that include and work with youth must actively engage with them as partners, equipping them with the necessary resources, skills and structured platforms to shape decision-making processes. Strengthening youth organizations and networks, establishing youth advisory councils and funding youth leadership programmes can provide critical avenues for young people to express their concerns, contribute solutions and influence policy directions. Social media platforms also provide an effective means to reach and mobilize young people, promote their collaboration and amplify their voice, ensuring their input is both

solicited and integrated into interventions. Amplifying youth voices, strengthening policy coherence and implementation, and fostering inclusive dialogue will create more responsive, dynamic and equitable agrifood systems that young people have the opportunities and agency to shape and benefit from.

INVEST MORE – SAFEGUARDING THE FUTURE OF YOUTH AND AGRIFOOD SYSTEMS

The future of agrifood systems and youth depends on the investments and policy actions made today. To thrive, young people need to be well-nourished, well-educated, gainfully employed in decent jobs and resilient to shocks. However, as this report reveals, significant deficits persist, requiring targeted investments across multiple domains to unlock youth potential and ensure the long-term sustainability of agrifood systems.

First, youth is a critical period for physical and cognitive development, making investments in human capital, including nutrition, education and skills training, essential for their long-term success and productivity.[281, 282] Food insecurity, malnutrition and limited access to quality education continue to hinder youth productivity and earning potential.[283] Expanding nutrition programmes alongside improving access to quality, market-driven education and training in both the formal and informal sectors will not only ensure that youth are healthier, but also prepare them for entrepreneurship and employment.[8] Investments could prioritize scaling up promising models such as rural advisory services, agribusiness incubation, Agricultural Technical and Vocational Education and Training; integrating agrifood system topics into school curricula; and promoting experiential learning through apprenticeships and mentorships.[214]

Second, dynamic and inclusive agrifood systems hinge on investments that improve market access and enhance productivity. It is of critical importance to invest in dynamic agrifood system businesses on and off-farm with the greatest potential for young people's decent employment. Connectivity remains another critical challenge. While most rural youth live in areas with relatively good agricultural potential, inadequate infrastructure – both physical and digital – limits their market participation and mobility within and beyond national boundaries (Chapter 2). The growing importance of spatial connectivity and functional territories, where households live, work, belong and maintain ties across multiple locations, highlights the role of youth migration, including temporary and seasonal movements. Small towns and intermediary cities, particularly in Africa and Asia, have emerged as key hubs that integrate rural and urban livelihoods, providing essential services and employment opportunities. These centres enable youthful and mobile workforce to access opportunities in agrifood system across multiple locations while strengthening rural-urban linkages.[284–286] Targeted investments in roads, energy, storage facilities and digital infrastructure can enhance market connectivity and create new economic opportunities.[3, 5, 179, 284, 285, 287, 288] Promoting digital literacy and fostering youth-led agritech innovations are also proven pathways for young people to participate in agrifood systems in transformative ways. Additionally, promoting safe and legal pathways for international migration, including through rights-based Bilateral Labour Migration Agreements and seasonal migration schemes, can help align labour supply with demand in areas facing shortages or surpluses.[3, 5, 179, 284, 285, 287, 288]

Third, persistent barriers in accessing productive resources such as land, finance and technology continue to constrain youth participation in agrifood enterprises.[8, 9, 289] Fostering greater youth engagement demands investments in youth-friendly financial products, including grants, loans and blended finance models that lower collateral requirements and provide flexible repayment terms. Complementary initiatives such as expanded financial literacy programmes and support for youth savings and credit associations can enhance financial inclusion. Secure access to land is also a paramount concern (Chapter 3). Policies that facilitate youth land access such as land tenure reforms, rental markets and co-ownership schemes are necessary to overcome structural barriers related to inheritance norms and land fragmentation.[250, 290] Additionally, providing affordable access to mechanization and other productivity-enhancing technologies can incentivize youth to remain in, or return to, farming and agribusiness, thus spurring innovation and growth in agrifood systems.[291, 292]

Finally, climate change poses a growing threat to the livelihoods of young people in agrifood systems. An estimated 395 million rural youth live in areas where climate change is projected to depress agricultural productivity (Chapter 2). Without targeted adaptation

strategies, these shifts could jeopardize economic prospects for a generation of young people. Targeted investments in climate-smart and sustainable agricultural practices can build resilience and create sustainable employment opportunities.[122] Funding youth-led initiatives in climate innovation, providing incentives for sustainable farming and expanding access to climate risk insurance will further enhance youth resilience. Social protection measures, including cash transfers, unemployment benefits and skills retraining programmes, will be critical for safeguarding youth economic security, particularly in climate-affected areas.[125, 126] Migration policies that support youth mobility while ensuring fair labour conditions can also provide alternative livelihood pathways for young people facing climate-induced displacement.

Investing in youth today secures the future of agrifood systems. By prioritizing human capital development, infrastructure and decent employment, equitable resource access and climate resilience, policymakers and stakeholders can nurture more inclusive and dynamic agrifood systems that provide meaningful opportunities for youth while ensuring long-term food security and economic prosperity. The potential gains are substantial. Using the data on youth employment shares in agrifood systems presented in Chapter 4 and ILO's estimates of the shares of youth outside the labour force, FAO conservatively estimates that eliminating youth unemployment and integrating NEET youth aged 20–24 into the workforce could boost global gross domestic product (GDP) by 1.4 percent – equivalent to USD 1.5 trillion. Agrifood systems alone would generate

> **"YOUTH INCLUSION FOSTERS GLOBAL PROSPERITY. INTEGRATING UNEMPLOYED AND NEET YOUTH AGED 20-24 INTO THE WORKFORCE COULD RAISE GLOBAL GDP BY USD 1.5 TRILLION, WITH AGRIFOOD SYSTEMS CONTRIBUTING USD 680 BILLION.**

87 million of these jobs, contributing about 45 percent of the estimated GDP growth (USD 680 billion) (see Appendix 4). Promoting youth engagement in agrifood systems is not only a moral imperative but also a strategic investment in global prosperity.

©VISIONTIME/MELINDA TORES AT THE CENTRAL DE ABASTOS WHOLESALE MARKET IN BOGOTÁ, COLOMBIA, A YOUNG TECHNICIAN SCANS AND PACKS CRATES OF MANGOES IN A COLD-STORAGE WAREHOUSE, SHOWCASING HOW YOUTH ARE POWERING THE POST-HARVEST SUPPLY CHAIN IN AGRIFOOD SYSTEMS.

YOUTH MOVE FOOD FORWARD

© FAO/ANIS MILI
IN JUBA, SOUTH SUDAN, A YOUNG FEMALE PASTORALIST STANDING AMONG HER CATTLE IN BEADKUEITH CATTLE CAMP ALONG THE JUBA-TEREKEKA ROAD.

NOTES, APPENDICES AND GLOSSARY

NOTES

CHAPTER 1

1. **UNDESA (United Nations Department of Economic and Social Affairs)**. 2023. World Population Prospects – 2022 Revision. *United Nations*. New York, USA. [Cited 6 December 2023]. https://population.un.org/wpp
2. **UNDESA**. 2024. World Population Prospects – 2024 Revision. *United Nations*. New York, USA. [Cited 7 August 2024]. https://population.un.org/wpp
3. **ILO (International Labour Organization)**. 2024. *World Employment and Social Outlook: Trends 2024*. Report. Geneva www.ilo.org/global/research/global-reports/weso/WCMS_908142/lang--en/index.htm
4. **Béné, C., Bakker, D., Chavarro, M.J., Even, B., Melo, J. & Sonneveld, A.** 2021. Global assessment of the impacts of COVID-19 on food security. *Global Food Security*, 31: 100575. https://doi.org/10.1016/j.gfs.2021.100575
5. **van Dijk, M., Morley, T., Rau, M.L. & Saghai, Y.** 2021. A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050. *Nature Food*, 2(7): 494–501. https://doi.org/10.1038/s43016-021-00322-9
6. **UNDRR (United Nations Office for Disaster Risk Reduction)**. 2020. *The human cost of disasters: An overview of the last 20 years (2000–2019)*. New York, USA. www.preventionweb.net/files/74124_humancostofdisasters20002019reportu.pdfwww.preventionweb.net/files/74124_humancostofdisasters20002019reportu.pdf
7. **IFAD (International Fund for Agricultural Development**). 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport
8. **Bousmah, I. & Grenier, G.** 2022. Labor shortages and immigration: The case of the Canadian agriculture sector. *Agribusiness*, 38(1): 220–235. https://doi.org/10.1002/agr.21719
9. **Christiaensen, L., Rutledge, Z. & Taylor, J.E.** 2020. *The future of work in agriculture: Some reflections*. Washington, DC, World Bank. https://doi.org/10.1596/1813-9450-9193
10. **ILO**. 2019. *Decent work for rural youth. Decent work in the rural economy: Policy guidance notes*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_dialogue/%40sector/documents/publication/wcms_729406.pdf
11. **Yeboah, F.K. & Jayne, T.S.** 2018. Africa's evolving employment trends. *The Journal of Development Studies*, 54(5): 803–832. https://doi.org/10.1080/00220388.2018.1430767
12. **Sumberg, J., Fox, L., Flynn, J., Mader, P. & Oosterom, M.** 2021. Africa's "youth employment" crisis is actually a "missing jobs" crisis. *Development Policy Review*, 39(4): 621–643. https://doi.org/10.1111/dpr.12528
13. **Zagata, L. & Sutherland, L-A.** 2015. Deconstructing the "young farmer problem in Europe": Towards a research agenda. *Journal of Rural Studies*, 38: 39–51. https://doi.org/10.1016/j.jrurstud.2015.01.003
14. **FAO**. 2022. *The future of food and agriculture: Drivers and triggers for transformation*. The Future of Food and Agriculture, No. 3. Rome. https://openknowledge.fao.org/items/66a787f4-af91-4f6e-b436-560010ab72d4
15. **Filmer, D. & Fox, L.** 2014. *Youth employment in sub-Saharan Africa*. Washington, DC, World Bank. https://doi.org/10.1596/978-1-4648-0107-5
16. **United Nations**. 2015. *Transforming our world: The 2030 Agenda for Sustainable Development*. New York, USA, United Nations General Assembly. https://sdgs.un.org/2030agenda
17. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series 23–34. Rome, FAO. https://doi.org/10.4060/cc4337en
18. **Nico, G. & Christiaensen, L.** 2023. *Jobs, food and greening: Exploring implications of the green transition for jobs in the agri-food system*. Washington, DC, World Bank. https://doi.org/10.1596/39819
19. **Reardon, T., Liverpool-Tasie, S., Belton, B., Dolislager, M., Minten, B., Popkin, B. & Vos, R.** 2023. *The rapid rise in domestic value chains of nutrient-dense foods (fruits, vegetables, and animal products) in Sub-Saharan Africa: Policy implications*. Initiative Technical Paper 1. Washington, DC, IFPRI, IITA, CGIAR. https://cgspace.cgiar.org/server/api/core/bitstreams/8f885757-9f53-44b4-9c3c-709247fae503/content
20. **Yeboah, T., Chigumira, E., John, I., Anyidoho, N.A., Manyong, V., Flynn, J. & Sumberg, J.** 2020. Hard work and hazard: Young people and agricultural commercialisation in Africa. *Journal of Rural Studies*, 76: 142–151. https://doi.org/10.1016/j.jrurstud.2020.04.027
21. **Flynn, J. & Sumberg, J.** 2021. Are Africa's rural youth abandoning agriculture? In: J. Sumberg ed. *Youth and the rural economy in Africa: Hard work and hazard*. pp. 43–57. Wallingford, UK, CABI. https://doi.org/10.1079/9781789245011.0003
22. **OECD (Organisation for Economic Co-operation and Development)**. 2021. *Jobs for rural youth: The role of local food economies*. Development Centre Studies. Paris, OECD Publishing. www.oecd.org/dev/jobs-for-rural-youth-692c0ca1-en.htm
23. **Meemken, E-M., Charlton, D., Christiaensen, L., Maertens, M., Oya, C., Reardon, T. & Stemmler, H.** 2024. Better data for decent work in the global food system. *Nature Food*, 5(6): 454–456. https://doi.org/10.1038/s43016-024-01002-0
24. **Christiaensen, L. & Maertens, M.** 2022. Rural employment in Africa: Trends and challenges. *Annual Review of Resource Economics*, 14(1): 267–289. https://papers.ssrn.com/abstract=4241834
25. **ILO**. 2023. *Women and men in the informal economy: A statistical update*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_protect/%40protrav/%40travail/documents/publication/wcms_869188.pdf
26. **Akar, H. & Şen, D.** 2017. Impact of internal migration movements on the schooling process in Turkey: Supervisors' views. *Education Policy Analysis Archives*, 25: 13. https://doi.org/10.14507/epaa.25.2693
27. **Varea, B.N., Gabaldón, M.P. & Chavez, M.** 2020. Using social media to motivate anti-migration sentiments. Political implications in the United States and beyond. *Tripodos Communication*, 49: 51–69. https://raco.cat/index.php/Tripodos/article/view/385645/478821
28. **Hertz, T. & Zahniser, S.** 2013. Is there a farm labor shortage? *American Journal of Agricultural Economics*, 95(2): 476–481.
29. **Loga, D.E., Kibwika, P. & Kyazze, F.B.** 2022. How do youth innovate to make agriculture gainful? Challenges and youth entrepreneurs in mid-western Uganda. *International Journal of Agricultural Research, Innovation and Technology (IJARIT)*, 12(1): 39–44. https://doi.org/10.22004/ag.econ.324168
30. **HLPE (High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security).** 2021 *Promoting youth engagement and*

employment in agriculture and food systems. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/bf72199b-eb52-4ecd-b9d7-ad329dfa7ede/content

31. **FAO**. 2014. *Youth and agriculture: Key challenges and concrete solutions*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/408708f0-82dc-418e-b92b-e2d7ec0cd2e6/content
32. **Huambachano, M., Arulingam, I., Bowness, E., Korzenszky, A., Mungai, C., Termine, P. & Wittman, H.** 2022. Knowledge networks to support youth engagement in sustainable food systems. *Frontiers in Sustainable Food Systems*, 6. https://doi.org/10.3389/fsufs.2022.867344
33. **Thew, H.** 2018. Youth participation and agency in the United Nations Framework Convention on Climate Change. *International Environmental Agreements: Politics, Law and Economics*, 18(3): 369–389. https://doi.org/10.1007/s10784-018-9392-2
34. **Ambikapathi, R., Schneider, K.R., Davis, B., Herrero, M., Winters, P. & Fanzo, J.C.** 2022. Global food systems transitions have enabled affordable diets but had less favourable outcomes for nutrition, environmental health, inclusion and equity. *Nature F ood*, 3(9): 764–779. https://doi.org/10.1038/s43016-022-00588-7
35. **Sumberg, J. & Okali, C.** 2013. Young people, agriculture, and transformation in rural Africa: An "opportunity space" approach. *Innovations: Technology, Governance, Globalization*, 8(1): 259–269.
36. **Timmer, C.P.** 1988. The agricultural transformation. In: H. Chenery & T.N. Srinivasan, eds. *Handbook of development economics*. Vol. 1. pp. 275–331. Amsterdam, the Netherlands, Elsevier Science Publishers. https://eclass.uoa.gr/modules/document/file.php/ECON284/4.%20Patterns%20of%20agricultural%20development/Timmer%201988%20Handbook%20of%20Development%20Economics%20The%20Agricultural%20TRansformation.pdf
37. **Barrett, C.B., Carter, M.R. & Timmer, C.P.** 2010. A century-long perspective on agricultural development. *American Journal of Agricultural Economics*, 92(2): 447–468. https://doi.org/10.1093/ajae/aaq005
38. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512
39. **Béné, C., Frankenberger, T.R., Nelson, S., Constas, M.A., Collins, G., Langworthy, M. & Fox, K.** 2023. Food system resilience measurement: Principles, framework and caveats. *Food Security*, 15(6): 1437–1458. https://doi.org/10.1007/s12571-023-01407-y
40. **FAO.** 2017. *The State of Food and Agriculture 2017: Leveraging food systems for inclusive rural transformation*. Rome.
41. **Abay, K.A., Asnake, W., Ayalew, H., Chamberlin, J. & Sumberg, J.** 2020. Landscapes of opportunity: Patterns of young people's engagement with the rural economy in sub-Saharan Africa. *The Journal of Development Studies*, 57(4): 594–613. https://doi.org/10.1080/00220388.2020.1808195
42. **Wiggins, S. & Proctor, S.** 2001. How special are rural areas? The economic implications of location for rural development. *Development Policy Review*, 19(4): 427–436. https://doi.org/10.1111/1467-7679.00142
43. **Sumberg, J., Chamberlin, J., Flynn, J., Glover, D. & Johnson, V.** 2020. Landscapes of rural youth opportunity. IFAD Research Series 47. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3521380
44. **FAO**. 2024. *The State of Food and Agriculture 2024*: *Value-driven transformation of agrifood systems* Rome. https://doi.org/10.4060/cd2616en
45. **Cooper, E.** 2012. Women and inheritance in sub-Saharan Africa: What can change? *Development Policy Review*, 30(5): 641–657. https://doi.org/10.1111/j.1467-7679.2012.00592.x
46. **Amare, M., Ghebru, H., Mavrotas, G. & Ogunniyi, A.** 2024. The role of land inheritance in youth migration and employment choices: Evidence from rural Nigeria. *The European Journal of Development Research*, 36(1): 135–160. https://doi.org/10.1057/s41287-023-00596-8
48. **Brooks, N. & Begley, A.** 2014. Adolescent food literacy programmes: A review of the literature. *Nutrition & Dietetics*, 71(3): 158–171. https://doi.org/10.1111/1747-0080.12096
49. **Kabeer, N.** 1999. Resources, Agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, 30(3): 435–464. https://doi.org/10.1111/1467-7660.00125
50. **Biggeri, M., Ballet, J. & Comim, F.** 2011. The capability approach and research on children: Capability approach and children's issues. In: S. Andresen, I. Diehm, U. Sander & H. Ziegler, eds. *Children and the good life: New challenges for research on children*. pp. 75–89. Dordrecht, the Netherlands, Springer. https://doi.org/10.1007/978-90-481-9219-9_6

CHAPTER 2

1. **De Brauw, A.** 2019. Migration out of rural areas and implications for rural livelihoods. *Annual Review of Resource Economics*, 11(1): 461–481. https://doi.org/10.1146/annurev-resource-100518-093906
2. **Mueller, V., Doss, C. & Quisumbing, A.** 2018. Youth migration and labour constraints in African agrarian households. *The Journal of Development Studies*, 54(5): 875–894. https://doi.org/10.1080/00220388.2018.1430770
3. **Christiaensen, L., Rutledge, Z. & Taylor, J.E.** 2021. Viewpoint: The future of work in agri-food. *Food Policy*, 99: 101963. https://doi.org/10.1016/j.foodpol.2020.101963
4. **Meemken, E-M., Charlton, D., Christiaensen, L., Maertens, M., Oya, C., Reardon, T. & Stemmler, H.** 2024. Better data for decent work in the global food system. *Nature Food*, 5(6): 454–456. https://doi.org/10.1038/s43016-024-01002-0
5. **Charlton, D., Rutledge, Z. & Taylor, J.E.** 2021. Evolving agricultural labor markets. In: C.B. Barrett & D.R. Just, eds. *Handbook of Agricultural Economics*, Vol. 5. pp. 4075–4133. Amsterdam, The Netherlands, Elsevier B.V.
6. **Taylor, J.E. & Martin, P.L.** 2001. Human capital: Migration and rural population change. In: *Handbook of Agricultural Economics,* Vol. 1. pp. 457–511. Amsterdam, The Netherlands, Elsevier B.V. https://doi.org/10.1016/S1574-0072(01)10012-5
7. **Chamberlin, J., Jayne, T.S. & Sitko, N.J.** 2020. Rural in-migration and agricultural development: Evidence from Zambia. *Agricultural Economics*, 51(4): 491–504. https://doi.org/10.1111/agec.12567
8. **Ingelaere, B., Christiaensen, L., De Weerdt, J. & Kanbur, R.** 2018. Why secondary towns can be important for poverty reduction – A migrant perspective. *World Development*, 105: 273–282. https://doi.org/10.1016/j.worlddev.2017.12.025
9. **de Brauw, A., Mueller, V. & Woldehanna, T.** 2013. Motives to remit: Evidence from tracked internal migrants in Ethiopia. *World Development*, 50: 13–23. https://doi.org/10.1016/j.worlddev.2013.04.008
10. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118
11. **Cattaneo, A., Girgin, S., De By, R., McMenomy, T., Nelson, A. & Vaz, S.** 2024. Worldwide delineation of multi-tier city–regions. *Nature Cities*, 1(7): 469–479. https://doi.org/10.1038/s44284-024-00083-z
12. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport
13. **UNDESA**. 2024. *World Population Prospects – Population Division – United Nations*. New York, NY. https://population.un.org/wpp
14. **UNDESA**. 2024. *International migration and sustainable development.* UN DESA/POP/2023/TR/NO. 7. New York, USA.
15. **UNDESA**. 2019. *World urbanization prospects: The 2018 revision*. New York, USA. https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf
16. **Potts, D.** 2012. Challenging the myths of urban dynamics in Sub-Saharan Africa: The evidence from Nigeria. *World Development*, 40(7): 1382–1393. https://doi.org/10.1016/j.worlddev.2011.12.004

17. **Lichter, D.T. & Brown, D.L.** 2011. Rural America in an urban society: Changing spatial and social boundaries. *Annual Review of Sociology*, 37(Volume 37, 2011): 565–592. https://doi.org/10.1146/annurev-soc-081309-150208
18. **Li, Y., Westlund, H. & Liu, Y.** 2019. Why some rural areas decline while some others not: An overview of rural evolution in the world. *Journal of Rural Studies*, 68: 135–143. https://doi.org/10.1016/j.jrurstud.2019.03.003
19. **White, B.** 2021. Human capital theory and the defectology of aspirations in policy research on rural youth. *The European Journal of Development Research*, 33(1): 54–70. https://doi.org/10.1057/s41287-020-00300-0
20. **Webster, D.** 2011. An overdue agenda: Systematizing East Asian peri-urban research. *Pacific Affairs*, 84(4): 631–642.
21. **Love, H. & Loh, T.H.** 2020. The rural-urban divide furthers myths about race and poverty –concealing effective policy solutions. *Brookings*, 8 December 2020. www.brookings.edu/articles/the-rural-urban-divide-furthers-myths-about-race-and-poverty-concealing-effective-policy-solutions
22. **Lerner, A.M. & Eakin, H.** 2011. An obsolete dichotomy? Rethinking the rural–urban interface in terms of food security and production in the global south. *The Geographical Journal*, 177(4): 311–320. https://doi.org/10.1111/j.1475-4959.2010.00394.x
23. **Christiaensen, L. & Kanbur, R.** 2017. Secondary towns and poverty reduction: Refocusing the urbanization agenda. *Annual Review of Resource Economics*, 9: 405–419. https://doi.org/10.1146/annurev-resource-100516-053453
24. **Pretty, J., Adams, B., Berkes, F., de Athayde, S.F., Dudley, N., Hunn, E., Maffi, L. *et al.*** 2009. The intersections of biological diversity and cultural diversity: Towards integration. *Conservation and Society*, 7(2): 100–112.
25. **Jensen, K.O., Denver, S. & Zanoli, R.** 2011. Actual and potential development of consumer demand on the organic food market in Europe. *NJAS: Wageningen Journal of Life Sciences*, 58(3–4): 79–84. https://doi.org/10.1016/j.njas.2011.01.005
26. **Peng, M.** 2019. The growing market of organic foods: Impact on the US and global economy. In: D. Biswas & S.A. Micallef, eds. *Safety and practice for organic food*. pp. 3–22. Cambridge, MA, Academic Press. https://doi.org/10.1016/B978-0-12-812060-6.00001-5
27. **ILO**. 2024. ILOSTAT. In: *ILOSTAT*. [Cited 5 July 2024]. https://ilostat.ilo.org
28. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512
29. **FAO**. 2023. *Building resilience in the Sahel region through job creation for youth: Innovatively supporting youth's access to decent employment and green jobs in agrifood systems*. Rome. https://doi.org/10.4060/cc7163en
30. **Chamberlin, J., Jayne, T.S. & Headey, D.** 2014. Scarcity amidst abundance? Reassessing the potential for cropland expansion in Africa. *Food Policy*, 48: 51–65. https://doi.org/10.1016/j.foodpol.2014.05.002
31. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series/23–34. Rome, FAO. https://doi.org/10.4060/cc4337en
32. **Yeboah, F.K. & Jayne, T.S.** 2018. Africa's evolving employment trends. *The Journal of Development Studies*, 54(5): 803–832. https://doi.org/10.1080/00220388.2018.1430767
33. **Abbass, K., Qasim, M.Z., Song, H., Murshed, M., Mahmood, H. & Younis, I.** 2022. A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research*, 29(28): 42539–42559. https://doi.org/10.1007/s11356-022-19718-6
34. **Kang, Y., Khan, S. & Ma, X.** 2009. Climate change impacts on crop yield, crop water productivity and food security – A review. *Progress in Natural Science*, 19(12): 1665–1674. https://doi.org/10.1016/j.pnsc.2009.08.001
35. **Ramankutty, N., Foley, J.A., Norman, J. & McSweeney, K.** 2002. The global distribution of cultivable lands: Current patterns and sensitivity to possible climate change. *Global Ecology and Biogeography*, 11(5): 377–392. https://doi.org/10.1046/j.1466-822x.2002.00294.x
36. **Fischer, G., Nachtergaele, F.O., van Velthuizen, H.T., Chiozza, F., Franceschini, G., Henry, D., Muchoney, D. & Tramberend, S.** 2021. Global Agro-Ecological Zones (GAEZ) V4 – Model documentation. Rome, FAO. [Cited 25 July 2024]. https://iiasa.ac.at/models-tools-data/gaez
37. **FAO**. 2024. *The State of Food and Agriculture 2024: Value-driven transformation of agrifood systems*. Rome. https://doi.org/10.4060/cd2616en
38. **Almulhim, A.I., Alverio, G.N., Sharifi, A., Shaw, R., Huq, S., Mahmud, M.J., Ahmad, S. *et al.*** 2024. Climate-induced migration in the Global South: An in depth analysis. *npj Climate Action*, 3(1): 1–12. https://doi.org/10.1038/s44168-024-00133-1
39. **De Brauw, A.** 2019. *Rural youth: Determinants of migration throughout the world*. 2019 Rural Development Report Background Papers 55. Rome, IFAD. www.ifad.org/en/web/knowledge/publication/asset/41490060
40. **De Haas, H.** 2021. A theory of migration: The aspirations-capabilities framework. *Comparative Migration Studies*, 9(1): 8. https://doi.org/10.1186/s40878-020-00210-4
41. **Amare, M., Abay, K.A., Arndt, C. & Shiferaw, B.** 2021. Youth migration decisions in Sub-Saharan Africa: Satellite-based empirical evidence from Nigeria. *Population and Development Review*, 47(1): 151–179. https://doi.org/10.1111/padr.12383
42. **Kosec, K., Ghebru, H., Holtemeyer, B., Mueller, V. & Schmidt, E.** 2017. The effect of land access on youth employment and migration decisions: Evidence from rural Ethiopia. *American Journal of Agricultural Economics*, 100(3): 931–954. https://doi.org/10.1093/ajae/aax087
43. **Clark, S., Harper, S. & Weber, B.** 2022. Growing up in rural America. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 8(4): 1–47.
44. **Cattaneo, A. & Robinson, S.** 2020. Multiple moves and return migration within developing countries: A comparative analysis. *Population, Space and Place*, 26(7): e2335. https://doi.org/10.1002/psp.2335
45. **FAO**. 2018. *The State of Food and Agriculture 2018. Migration, agriculture and rural development*. Rome. https://openknowledge.fao.org/handle/20.500.14283/i9549en
46. **IOM (International Organization for Migration)**. 2019. *International Migration Law No. 34. Glossary on Migration*. Grand-Saconnex, Switzerland. https://publications.iom.int/system/files/pdf/IML_34_Glossary.pdf
47. **United Nations.** 2024. *International Migrant Stock 2024: Key facts and figures*. UN DESA/POP/2024/DC/NO. 13. New York, USA.
48. **Ratha, D., Plaza, S. & Kim, E.J.** 2024. In 2024, remittance flows to low- and middle-income countries are expected to reach $685 billion, larger than FDI and ODA combined. *World Bank Blogs*, 18 December 2024. https://blogs.worldbank.org/en/peoplemove
49. **UNDESA**. 2020. International Migrant Stock 2020. In: *United Nations Population Division*. New York, USA. [Cited 12 May 2025]. https://un.org/development/desa/pd/content/international-migrant-stock.
50. **Nicolle, H.** 2022. *Youth, migration and development: A new lens for critical times*. KNOMAD paper 41. Washington, DC, World Bank. https://hal.parisnanterre.fr/hal-04392354v1/file/KNOMAD%2520Working%2520Paper%252041-Youth%2520Migration-March%25202022.pdf
51. **Czaika, M. & de Haas, H.** 2015. Evaluating migration policy effectiveness. In: *Routledge handbook of immigration and refugee studies*. pp. 34–40. Abingdon-on-Thames, UK, Routledge. https://api.taylorfrancis.com/content/chapters/edit/download?identifierName=doi&identifierValue=10.4324/9781315759302-4&type=chapterpdf
52. **Belmonte, M., Conte, A., Ghio, D., Kalantaryan, S. & Mcmahon, S.** 2020. *Youth and migration: An overview*. Luxembourg, Publications Office of the European Union. https://publications.jrc.ec.europa.eu/repository/handle/JRC122402
53. **Belloni, M.** 2019. Family project or individual choice? Exploring agency in young Eritreans' migration. *Journal of Ethnic and Migration Studies*, 46(2): 1–18. https://doi.org/10.1080/1369183X.2019.1584698
54. **Black, R. & Collyer, M.** 2014. Populations "trapped" at times of crisis. *Forced Migration Review*, 45. https://ora.ox.ac.uk/objects/uuid:8ccf0d75-deea-487b-b8f6-4ffcebdd87fd

55. **Smith, M.D. & Floro, M.S.** 2020. Food insecurity, gender, and international migration in low- and middle-income countries. *Food Policy*, 91: 101837. https://doi.org/10.1016/j.foodpol.2020.101837
56. **Heckert, J., Pereira, A., Doss, C., Myers, E.C. & Quisumbing, A.** 2021. Structural transformation and gendered transitions to adulthood among rural youth: Cross-national evidence from low- and middle-income countries. *The Journal of Development Studies*, 57(4): 614–634. https://doi.org/10.1080/00220388.2020.1808196
57. **Young, A.** 2013. Inequality, the urban-rural gap, and migration. *The Quarterly Journal of Economics*, 128(4): 1727–1785.
58. **Srinivasan, S., ed.** 2024. *Becoming a young farmer: Young people's pathways into farming. Canada, China, India and Indonesia*. Rethinking Rural. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7
59. **Eckert, E., Turner, E. & Yeager Sallah, J.A.** 2019. *Youth rural-urban migration in Bungoma, Kenya: Implications for the agricultural workforce*. Research Triangle Park, NC, RTI Press. https://doi.org/10.3768/rtipress.2019.op.0062.1908
60. **World Bank**. 2025. The World Bank in Gabon. In: *World Bank Group*. Washington, DC. [Cited 15 April 2025]. www.worldbank.org/en/country/gabon/overview?utm_source
61. **McKenzie, D.J.** 2006. *A profile of the world's young developing country migrants*. Washington, DC, World Bank; Bonn, Germany, Institute for the Study of Labor (IZA). https://docs.iza.org/dp2948.pdf
62. **Stark, O. & Bloom, D.E.** 1985. The new economics of labor migration. *The American Economic Review*, 75(2): 173–178.
63. **Bryceson, D.F.** 2019. Transnational families negotiating migration and care life cycles across nation-state borders. *Journal of Ethnic and Migration Studies*, 45(16): 3042–3064. https://doi.org/10.1080/1369183X.2018.1547017
64. **Boyden, J., Dawes, A., Dornan, P. & Tredoux, C.** 2019. Adolescence and youth: A time of responsibility and transformation. In: *Tracing the Consequences of Child Poverty: Evidence from the Young Lives Study in Ethiopia, India, Peru and Vietnam*. pp. 101–132. Bristol, UK, Policy Press. https://bristoluniversitypressdigital.com/downloadpdf/book/9781447348368/ch006.pdf
65. **Heckert, J.** 2015. New perspective on youth migration: Motives and family investment patterns. *Demographic Research*, 33: 765–800.
66. **Kikon, R. & Huijsmans, R.** 2023. Analysing youth migrations through the lens of generation. In: *Handbook on Migration and the Family*. pp. 170–183. Cheltenham, UK, Edward Elgar Publishing. www.elgaronline.com/edcollchap/book/9781789908732/book-part-9781789908732-17.xml
67. **Rigg, J., Phongsiri, M., Promphakping, B., Salamanca, A. & Sripun, M.** 2020. Who will tend the farm? Interrogating the ageing Asian farmer. *The Journal of Peasant Studies*, 47(2): 306–325. https://doi.org/10.1080/03066150.2019.1572605
68. **Beegle, K. & Poulin, M.** 2013. Migration and the transition to adulthood in contemporary Malawi. *The ANNALS of the American Academy of Political and Social Science*, 648(1): 38–51. https://doi.org/10.1177/0002716213481329
69. **Gavonel, M.F.** 2017. *Patterns and drivers of internal migration among youth in Ethiopia, India, Peru and Vietnam*. Working Paper 169. Oxford, UK, Young Lives. https://repositorio.grade.org.pe/handle/20.500.12820/451
70. **Bernard, A., Bell, M. & Charles-Edwards, E.** 2014. Life-course transitions and the age profile of internal migration. *Population and Development Review*, 40(2): 213–239. https://doi.org/10.1111/j.1728-4457.2014.00671.x
71. **Bezu, S. & Holden, S.T.** 2014. *Rural-urban Youth migration and informal self-employment in Ethiopia*. Ås, Norway, Norwegian University of Life Sciences, Center for Land Tenure. http://hdl.handle.net/11250/2475136
72. **Boyden, J.** 2018. "We're not going to suffer like this in the mud": Educational aspirations, social mobility and independent child migration among populations living in poverty. In: M. Arnot, C. Schneider & O. Welply, eds. *Education, mobilities and migration*. pp. 26–46. Abingdon-on-Thames, UK, Routledge. https://doi.org/10.4324/9781315622828
73. **Thorsen, D.** 2010. The place of migration in girls' imagination. *Journal of Comparative Family Studies*, 41(2): 265–280. https://doi.org/10.3138/jcfs.41.2.265
74. **Mashayekhi, M. & Twarog, S.** 2014. Remittances, development and youth. In: J. Cortina & P. Taran, P. eds, *Migration and youth: Challenges and opportunities*. New York, USA, United Nations Children's Fund for the Global Migration Group. https://coilink.org/20.500.12592/q32fxk
75. **Kebu, H., Berisso, O. & Mulugeta, M.** 2023. Drivers of migration and determinants of wellbeing among internal youth migrants in Ethiopia: Towns along Addis Ababa–Adama route in focus. *Heliyon*, 9(3): e13780. https://doi.org/10.1016/j.heliyon.2023.e13780
76. **Elder, S., de Haas, H., Principi, M. & Schewel, K.** 2015. *Youth and rural development: Evidence from 25 school-to-work transition surveys*. Geneva, ILO. https://search.issuelab-dev.org/resources/22479/22479.pdf
77. **Chamberlin, J., Ramos, C. & Abay, K.** 2021. Do more vibrant rural areas have lower rates of youth out-migration? Evidence from Zambia. *The European Journal of Development Research*, 33(4): 951–979. https://doi.org/10.1057/s41287-021-00404-1
78. **Milasi, S.** 2020. What drives youth's intention to migrate abroad? Evidence from international survey data. *IZA Journal of Development and Migration*, 11(1): 20200012. https://doi.org/10.2478/izajodm-2020-0012
79. **Van Mol, C.** 2016. Migration aspirations of European youth in times of crisis. *Journal of Youth Studies*, 19(10): 1303–1320. https://doi.org/10.1080/13676261.2016.1166192
80. **Dibeh, G., Fakih, A. & Marrouch, W.** 2018. Decision to emigrate amongst the youth in Lebanon. *International Migration*, 56(1): 5–22. https://doi.org/10.1111/imig.12347
81. **FAO**. 2020. *Migrant workers and the COVID-19 pandemic*. Rome. https://doi.org/10.4060/ca8559en
82. **De Menezes, M.A., Da Silva, M.S. & Cover, M.** 2012. Migrant workers in sugarcane mills: A study of social networks and recruitment intermediaries in Brazil. *Agrarian South: Journal of Political Economy: A triannual Journal of Agrarian South Network and CARES*, 1(2): 161–180. https://doi.org/10.1177/227797601200100202
83. **Velásquez Pinto, M., Yáñez Betancourt, L. & Molina Castro, F.** 2020. *Inserción laboral de los trabajadores migrantes en el sector rural en Ch*ile [Job insertion of migrant workers in the rural sector in Chile]. Geneva, FAO, IOM, ILO. www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/---sro-santiago/documents/publication/wcms_752034.pdf
84. **Floresi, S.M.L.** 2010. Movilidad y migración de familias jornaleras: Una mirada a través de genealogías [Mobility and migration of day laborer families: A look through genealogies]. *Empiria. Revista de Metodología de las Ciencias Sociales*, 19): 183–203.
85. **FAO & WorldFish**. 2017. *Women's empowerment in aquaculture: Two case studies from Bangladesh*. Rome; Penang, Malaysia. https://hdl.handle.net/20.500.12348/270
86. **Bhattacharjee, S.S. & Raaj, V.** 2016. *Precarious work in the Asian seafood global value chain*. Recommendations for the ILO at the International Labour Conference, 2016. www.ituc-csi.org/IMG/pdf/precarious_work_in_the_asian_seafood_global_value_chain.pdf
87. **Fabry, A. & Maertens, M.** 2025. Temporary labor mobility to various geographical and sectoral destinations improves rural incomes – Insights from Peru. *World Development*, 185: 106782. https://doi.org/10.1016/j.worlddev.2024.106782
88. **Mueller, V. & Lee, H.L.** 2019. Can migration be a conduit for transformative youth employment. In: V. Mieller and J. Thurlow, eds. *Youth and jobs in rural Africa: Beyond stylized facts*. pp. 25–46. Oxford, Oxford University Press. https://library.oapen.org/bitstream/handle/20.500.12657/37432/1/9780198848059.pdf#page=48
89. **USDA (United States Department of Agriculture)**. 2025. Farm labor. In: *USDA*. Washington, DC. [Cited 2 April 2025]. www.ers.usda.gov/topics/farm-economy/farm-labor?utm_source
90. **Collins, J.** 2016. *New immigrants improving productivity in Australian agriculture*. RIRDC Publication No. 16/027. Canberra, Australian Government. Rural Industries Research and Development Corporation. https://agrifutures.com.au/wp-content/uploads/publications/16-027.pdf

91. **Natale, F., Kalantaryan, S., Scipioni, M., Alessandrini, A. & Pasa, A.** 2019. *Migration in EU rural areas*. EUR 29779 EN. Luxembourg, Publications Office of the European Union. https://publications.jrc.ec.europa.eu/repository/handle/JRC116919
92. **Farinella, D., Nori, M. & Ragkos, A.** 2017. Change in Euro-Mediterranean pastoralism: Which opportunities for rural development and generational renewal? *Grassland Science in Europe*, 22: 23–36.
93. **Nori, M.** 2018. Migration, agriculture and rural territories in the Mediterranean. In: CIHEAM, ed. *MediTERRA 2018 (English)*. pp. 79–96. Paris, Presses de Sciences Po. https://shs.cairn.info/article/SCPO_CHEA_2018_02_0079
94. **FAO**. 2021. *Seasonal migration and child labour in agriculture*. Rome. https://doi.org/10.4060/cb7360en
95. **Kou, A. & Van De Glind, H.** 2013. Migrant children in child labour: A vulnerable group in need of attention. In: *Children on the Move*. pp. 27–43. Grand-Saconnex, Switzerland, IOM. https://doi.org/10.18356/091a25aa-en

CHAPTER 3

1. **Geza, W., Ngidi, M., Ojo, T., Adetoro, A.A., Slotow, R. & Mabhaudhi, T.** 2021. Youth participation in agriculture: A scoping review. *Sustainability*, 13(16): 9120. https://doi.org/10.3390/su13169120
2. **Srinivasan, S. & White, B.** 2024. Introduction: Young people's pathways into farming. In: S. Srinivasan, ed. *Becoming a young farmer. Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 1–22. Rethinking Rural. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_1
3. **AKATIGA & White, B.** 2015. *Would I like to be a farmer?* Bandung, Indonesia, AKATIGA Foundation.
4. **Akram-Lodhi, A.H. & Huijsmans, R.** 2024. Conclusion: Youth aspirations, trajectories, and farming futures. In: S. Srinivasan, ed. *Becoming a young farmer. Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 415–433. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_15
5. **DeJaeghere, J.G., McCleary, K.S. & Josić, J.** 2016. Conceptualizing youth agency. In: J.G. DeJaeghere, J. Josić & K.S. McCleary, eds. *Education and youth agency*. pp. 1–24. Advancing Responsible Adolescent Development. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-319-33344-1_1
6. **Putnam, R.D.** 1995. Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1): 65–78.
7. **Ploeg, J.D. van der & Marsden, T.** 2008. *Unfolding webs – the dynamics of regional rural development*. Assen, the Netherlands, Van Gorcum. https://research.wur.nl/en/publications/unfolding-webs-the-dynamics-of-regional-rural-development
8. **Von Muenchhausen, S. & Knickel, K.** 2010. Rural development dynamics: A comparison of changes in rural web configurations in six European regions. In: P. Miloni & F. Ventura, eds. *Networking the rural: The future of green regions in Europe.* pp. 167–190. Assen, the Netherlands, Van Gorcum. www.researchgate.net/publication/277177594_Rural_development_dynamics_A_comparison_of_changes_in_rural_web_configurations_in_six_European_regions
9. **Rivera, M., Knickel, K., María Díaz-Puente, J. & Afonso, A.** 2019. The role of social capital in agricultural and rural development: Lessons learnt from case studies in seven countries. *Sociologia Ruralis*, 59(1): 66–91. https://doi.org/10.1111/soru.12218
10. **Snider, A., Afonso Gallegos, A., Gutiérrez, I. & Sibelet, N.** 2017. Social capital and sustainable coffee certifications in Costa Rica. *Human Ecology*, 45(2): 235–249. https://doi.org/10.1007/s10745-017-9896-3
11. **Svendsen, G.T. & Svendsen, G.L.H.** 2009. Social capital, migration and the welfare state. In: G. Tripp, M. Payne & D. Diodorus, eds. *Social capital*. pp. 151–172. New York,USA, Nova Science Publishers.
12. **Koutsou, S., Partalidou, M. & Ragkos, A.** 2014. Young farmers' social capital in Greece: Trust levels and collective actions. *Journal of Rural Studies*, 34: 204–211. https://doi.org/10.1016/j.jrurstud.2014.02.002
13. **Dale, A. & Sparkes, J.** 2008. Protecting ecosystems: Network structure and social capital mobilization. *Community Development Journal*, 43(2): 143–156. https://doi.org/10.1093/cdj/bsm007
14. **Dale, A. & Onyx, J.** 2005. *A dynamic balance*. Vancouver, BC, UBC Press. www.ubcpress.ca/a-dynamic-balance
15. **Cotula, L., Polack, E., Berger, T. & Schwartz, B.** 2019. *Rural producer agency and agricultural value chains: What role for socio-legal empowerment?* London, International Institute for Environment and Development. www.iied.org/12607iied
16. **HLPE**. 2021. *Promoting youth engagement and employment in agriculture and food systems*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/bf72199b-eb52-4ecd-b9d7-ad329dfa7ede/content
17. **Lowe, C., Ludi, E., Sève, M.D.L. & Tsui, J.** 2019. *Linking social protection and water security to empower women and girls*. London, Overseas Development Institute.
18. **Cassidy, A., Srinivasan, S. & White, B.** 2019. Generational transmission of smallholder farms in late capitalism. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*, 40(2): 220–237. https://doi.org/10.1080/02255189.2019.1592744
19. **Stockbridge, M., Dorward, A. & Kydd, J.** 2003. Farmer organizations for market access. Briefing paper presented at Stakeholders Meeting on Farmer Organizations in Malawi, Kalikuti Hotel, Lilongwe, Malawi, 18–19 June 2003. https://assets.publishing.service.gov.uk/media/57a08ce540f0b652dd001634/R8275_040516_Bfg_Paper_FO_for_market_access.pdf
20. **Trivelli, C. & Morel, J.** 2021. Rural youth inclusion, empowerment, and participation. *The Journal of Development Studies*, 57(4): 635–649. https://doi.org/10.1080/00220388.2020.1808194
21. **Botrić, V.** 2023. Urban–rural differences in youth engagement in Croatia. *Regional Science Policy & Practice*, 15(4): 909–927. https://doi.org/10.1111/rsp3.12585
22. **United Nations**. 2023. *Our Common Agenda Policy Brief 3: Meaningful youth engagement in policymaking and decision-making processes*. New York, USA. www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-youth-engagement-en.pdf
23. **UNICEF (United Nations Children's Fund)**. 2024. *Meaningful youth engagement in the multilateral system.* New York, USA, Innocenti Global Office of Research and Foresight. www.unicef.org/innocenti/media/9701/file/UNICEF-Innocenti-Meaningful-Youth-Engagement-2024.pdf
24. **Phillips, L. & Perzenieto, P.** 2019. *Unlocking the potential of rural youth: The role of policies and institutions*. Rome, IFAD. https://coilink.org/20.500.12592/30922n
25. **Ruzzante, S., Labarta, R. & Bilton, A.** 2021. Adoption of agricultural technology in the developing world: A meta-analysis of the empirical literature. *World Development*, 146: 105599. https://doi.org/10.1016/j.worlddev.2021.105599
26. **World Bank**. 2025. *Gender Data Portal*. Washington, DC. [Cited 11 March 2025]. https://genderdata.worldbank.org/en/home
27. **AfDB (African Development Bank)**. 2020. African Economic Outlook 2020: *Developing Africa's workforce for the future*. Abidjan, Côte d'Ivoire, African Development Bank Group.
28. **UNICEF**. 2022. Learning and skills. *UNICEF*. New York, USA. [Cited 5 December 2024]. https://data.unicef.org/resources/dataset/learning-and-skills
29. **Leavy, J. & Hossain, N.** 2014. Who wants to farm? Youth Aspirations, opportunities and rising food prices. *IDS Working Papers*, 2014(439): 1–44. https://doi.org/10.1111/j.2040-0209.2014.00439.x
30. **Ansell, N., Froerer, P., Huijsmans, R., Dungey, C., Dost, A. & Piti**. 2020. Educating "surplus population": Uses and abuses of aspiration in the rural peripheries of a globalising world. *Fennia – International Journal of Geography*, 198(1–2). https://doi.org/10.11143/fennia.90756

31. **White, B.** 2012. Agriculture and the generation problem: Rural youth, employment and the future of farming. *IDS Bulletin*, 43(6): 9–19. https://doi.org/10.1111/j.1759-5436.2012.00375.x
32. **White, B.** 2021. Human capital theory and the defectology of aspirations in policy research on rural youth. *The European Journal of Development Research*, 33(1): 54–70. https://doi.org/10.1057/s41287-020-00300-0
33. **Archambault, C.** 2014. Young perspectives on pastoral rangeland privatization: Intimate exclusions at the intersection of youth identities. *The European Journal of Development Research*, 26(2): 204–218. https://doi.org/10.1057/ejdr.2013.59
34. **Stoevska, V.** 2024. Insights into youth participation in work-based learning. *ILO.* Geneva. [Cited 29 December 2024]. https://ilostat.ilo.org/blog/insights-into-youth-participation-in-work-based-learning/
35. **Biswal, P., Sahoo, C.K. & Mishra, N.** 2025. Participation among tribal youths of India in vocational training measures: A systematic review of literature. *Evaluation and Program Planning*, 109: 102530. https://doi.org/10.1016/j.evalprogplan.2024.102530
36. **Filmer, D. & Fox, L.** 2014. *Youth employment in sub-Saharan Africa*. Africa Development Series. Washington, DC, World Bank. doi:10.1596/978-1-4648-0107-5.
37. **Fox, L. & Kaul, U.** 2018. The evidence is in: How should youth employment programs in low-income countries be designed? *World Bank Policy Research Working Paper* 8500. Washington, DC, World Bank. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3238339
38. **World Bank**. 2018. *World Development Report 2018: Learning to realize education's promis*e. Washington, DC, World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/28340/9781464810961.pdf
39. **Fox, L. & Gandhi, D.** 2021. *Youth employment in sub-Saharan Africa. Progress and prospects*. AGI Working Paper 28. Washington, DC, Brookings.
40. **World Bank.** 2019. *World Development Report 2019: The changing nature of work*. Washington, DC, World Bank. https://documents1.worldbank.org/curated/en/816281518818814423/pdf/2019-WDR-Report.pdf
41. **Bandara, A.** 2019. Youth labor market expectations and job matching in sub-Saharan Africa: Evidence from school-to-work transition surveys. *Applied Economics*, 51(8): 762–780. https://doi.org/10.1080/00036846.2018.1512742
42. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. p. 294. www.ifad.org/ruraldevelopmentreport
43. **Daum, T.** 2019. Of bulls and bulbs: Aspirations, opinions and perceptions of rural adolescents and youth in Zambia. *Development in Practice*, 29(7): 882–897. https://doi.org/10.1080/09614524.2019.1646209
44. **Elias, M., Mudege, N.N., Lopez, D.E., Najjar, D., Kandiwa, V., Luis, J.S., Yila, J. *et al.*** 2018. Gendered aspirations and occupations among rural youth, in agriculture and beyond: A cross-regional perspective. *Journal of Gender, Agriculture and Food Security*, 3(1): 82–107. https://cgspace.cgiar.org/bitstream/10568/99065/1/Gendered_Elias_2018.pdf
45. **Yang, P. & Ou, Y.** 2022. *Transforming public agricultural extension and advisory service systems in smallholder farming*. FAO, Rome. https://openknowledge.fao.org/server/api/core/bitstreams/233088b3-baca-487b-9c26-ecc2acd3dd1d/content
46. **Ullah, A., Adams, F. & Bavorova, M.** 2024. Empowering young farmers' voices in climate change extension programs: An in-depth analysis of decision-making dynamics and social media engagement. *International Journal of Disaster Risk Reduction*, 111: 104713.
47. **Ayi, N.** 2022. Farmer field school extension approach: A knowledge booster in Calabar Agricultural Zone, Cross River State, Nigeria. *Journal of Agricultural Extension and Rural Development*. https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=4240081
48. **Wordofa, M.G., Endris, G.S., Aweke, C.S., Hassen, J.Y. & Wolyie, J.** 2023. *Status and determinants of youth participation in selected development interventions in agro-pastoral areas*. Policy Brief. West Lafayette, IN, Long-term Assistance and Services for Research – Partners for University-Led Solutions Engine (LASER PULSE). https://laserpulse.org/wp-content/uploads/2023/10/Status-and-Determinants-of-Youth-Participation.pdf
49. **Franzel, S., Lowicki-Zucca, J., Miiro, R. & Uwitonze, N.** 2020. Demand-driven extension and advisory services – catalysing opportunities for youth in agriculture. *Rural 21: International Journal for Rural Development*, 54(2): 23–25.
50. **ILO (International Labour Organization)**. 2024. *Global Employment Trends for Youth 2024. Decent work, brighter futures*. Geneva. www.ilo.org/sites/default/files/2024-11/GET_2024_EN_web4.pdf
51. **Das, M., Guedes, A., Moletsane, R. & Svanemyr, J.** 2022. Singularity and diversity in child, early, and forced marriage and unions. *Journal of Adolescent Health*, 70(3): S1–S4. https://doi.org/10.1016/j.jadohealth.2021.12.008
52. **UNICEF**. 2024. Child marriage is a violation of human rights, but is all too common. *UNICEF*. New York, USA. [Cited 4 April 2024]. https://data.unicef.org/topic/child-protection/child-marriage
53. **Björkman-Nyqvist, M.** 2013. Income shocks and gender gaps in education: Evidence from Uganda. *Journal of Development Economics*, 105: 237–253. https://doi.org/10.1016/j.jdeveco.2013.07.013
54. **Carrico, A.R., Donato, K.M., Best, K.B. & Gilligan, J.** 2020. Extreme weather and marriage among girls and women in Bangladesh. *Global Environmental Change*, 65: 102160. https://doi.org/10.1016/j.gloenvcha.2020.102160
55. **FAO**. 2022. *The COVID-19 consequences on child labour in agrifood systems*. Rome. https://doi.org/10.4060/cc2136en
56. **Flor, L.S., Friedman, J., Spencer, C.N., Cagney, J., Arrieta, A., Herbert, M.E., Stein, C. *et al.*** 2022. Quantifying the effects of the COVID-19 pandemic on gender equality on health, social, and economic indicators: A comprehensive review of data from March, 2020, to September, 2021. *The Lancet*, 399(10344): 2381–2397. https://doi.org/10.1016/S0140-6736(22)00008-3
57. **Bezu, S. & Holden, S.** 2014. Are rural youth in Ethiopia abandoning agriculture? *World Development*, 64: 259–272. https://doi.org/10.1016/j.worlddev.2014.06.013
58. **Sumberg, J., Anyidoho, N.A., Leavy, J., te Lintelo, D.J.H. & Wellard, K.** 2012. Introduction: The young people and agriculture "problem" in Africa. *IDS Bulletin*, 43(6): 1–8. https://doi.org/10.1111/j.1759-5436.2012.00374.x
59. **Griffin, C., Sirimorok, N., Dressler, W.H., Sahide, M.A.K., Fisher, M.R., Faturachmat, F., Muin, A.V.F. *et al.*** 2024. The persistence of precarity: Youth livelihood struggles and aspirations in the context of truncated agrarian change, South Sulawesi, Indonesia. *Agriculture and Human Values*, 41(1): 293–311. https://doi.org/10.1007/s10460-023-10489-5
60. **Kosec, K., Ghebru, H., Holtemeyer, B., Mueller, V. & Schmidt, E.** 2017. The effect of land access on youth employment and migration decisions: Evidence from rural Ethiopia. *American Journal of Agricultural Economics*, 100(3): 931–954. https://doi.org/10.1093/ajae/aax087
61. **Amare, M., Ghebru, H., Mavrotas, G. & Ogunniyi, A.** 2024. The role of land inheritance in youth migration and employment choices: Evidence from rural Nigeria. *The European Journal of Development Research*, 36(1): 135–160. https://doi.org/10.1057/s41287-023-00596-8
62. **Banda, A., Chapoto, A. & Zulu-Mbata, O.** 2018. *Emergent Farmer Survey (EFS) Survey Report*. Lusaka, Zambia, Indaba Agricultural Policy Research Institute (IAPRI). www.researchgate.net/profile/Olipa-Zulu/publication/331675034_Emergent_Farmer_Survey_EFS_Survey_Report/links/5c879932a6fdcc88c39c356c/Emergent-Farmer-Survey-EFS-Survey-Report.pdf
63. **Pedersen, M.F.** 2017. *Dynamics of farmland ownership, aging landowners and aging farmers.* Department of Food and Resource Economics, University of Copenhagen. https://pacioli.org/PaciolilImages/documents/25Session3paper2.pdf
64. **Widmar, D.A. & Gloy, B.A.** 2015. Aging American farmers and their farmland. *Agricultural Economic Insights*. West Lafayette, IN. [Cited 25 March 2025]. https://aei.ag/overview/article/aging-american-farmers-and-their-farmland
65. **Yeboah, F.K., Jayne, T.S., Muyanga, M. & Chamberlin, J.** 2019. *Youth access to land, migration and employment opportunities: Evidence from sub-Saharan Africa*. IFAD Research Series 53. Rome, IFAD. https://catalogue.unccd.int/1390_13_Yeboah%20et%20al._2019%20RDR%20BACKGROUND%20PAPER(1).pdf
66. **Moreda, T.** 2023. The social dynamics of access to land, livelihoods and the rural youth in an era of rapid rural change: Evidence from Ethiopia. *Land Use Policy*, 128: 106616. https://doi.org/10.1016/j.landusepol.2023.106616

67. **Berckmoes, L.H. & White, B.** 2016. Youth, farming, and precarity in rural Burundi. In: R. Huijsmans, ed. *Generationing development: A relational approach to children, youth and development*. pp. 291–312. London, Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-55623-3_13
68. **White, B.** 2019. *Rural youth, today and tomorrow*. IFAD research series 48. Rome, IFAD. www.ifad.org/documents/d/new-ifad.org/08_white_2019-rdr-background-paper-pdf
69. **White, B.** 2020. *Agriculture and the generation problem*. Rugby, UK, Practical Action Publishing. https://practicalactionpublishing.com/book/45/download%3Ftype%3Ddownload.pdf
70. **Liu, J., Fang, Y., Wang, G., Liu, B. & Wang, R.** 2023. The aging of farmers and its challenges for labor-intensive agriculture in China: A perspective on farmland transfer plans for farmers' retirement. *Journal of Rural Studies*, 100: 103013. https://doi.org/10.1016/j.jrurstud.2023.103013
71. **Amanor, K.S.** 2010. Family values, land sales and agricultural commodification in South-Eastern Ghana. *Africa*, 80(1): 104–125. https://doi.org/10.3366/E0001972009001284
72. **Kidido, J.K., Bugri, J.T. & Kasanga, R.K.** 2017. Dynamics of youth access to agricultural land under the customary tenure regime in the Techiman traditional area of Ghana. *Land Use Policy*, 60: 254–266. https://doi.org/10.1016/j.landusepol.2016.10.040
73. **Whyte, S.R. & Acio, E.** 2017. Generations and access to land in postconflict Northern Uganda: "Youth have no voice in land matters". *African Studies Review*, 60(3): 17–36. https://doi.org/10.1017/asr.2017.120
74. **Hunsberger, C., Corbera, E., Borras, S.M., Franco, J.C., Woods, K., Work, C., De La Rosa, R. *et al.*** 2017. Climate change mitigation, land grabbing and conflict: Towards a landscape-based and collaborative action research agenda. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*, 38(3): 305–324. https://doi.org/10.1080/02255189.2016.1250617
75. **Schoenberger, L., Hall, D. & Vandergeest, P.** 2019. What happened when the land grab came to Southeast Asia? In: P. Vandergeest & L. Schoenberger, eds. *De-centring land grabbing*. pp. 1–29. London, Routledge. https://doi.org/10.4324/978135113487
76. **Li, T.M.** 2017. Intergenerational displacement in Indonesia's oil palm plantation zone. *The Journal of Peasant Studies*, 44(6): 1158–1176. https://doi.org/10.1080/03066150.2017.1308353
77. **Holden, S.T. & Tilahun, M.** 2021. Are land-poor youth accessing rented land? Evidence from Northern Ethiopia. *Land Use Policy*, 108: 105516. https://doi.org/10.1016/j.landusepol.2021.105516
78. **Peterman, A.** 2012. Widowhood and asset inheritance in sub-Saharan Africa: Empirical evidence from 15 countries. *Development Policy Review*, 30(5): 543–571. https://doi.org/10.1111/j.1467-7679.2012.00588.x
79. **Narayanan, S.** 2023. "I had to bear this burden": Youth transcending constraints to become farmers in Madhya Pradesh, India. In: S. Srinivasan, ed. *Becoming a young farmer: Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 277–301. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_10
80. **Rao, N.** 2017. *"Good women do not inherit land": Politics of land and gender in India*. London, Routledge. https://doi.org/10.4324/978131514461
81. **Harrington, A. & Chopra, T.** 2010. *Arguing traditions: Denying Kenya's women access to land rights.* Justice for the Poor Research Report No. 2. Washington, DC, World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/02fc18a1-a04c-5b9f-b6cf-a5b026321cf8/content
82. **Heckert, J., Pereira, A., Doss, C., Myers, E.C. & Quisumbing, A.** 2020. Structural transformation and gendered transitions to adulthood among rural youth: Cross-national evidence from low- and middle-income countries. *The Journal of Development Studies,* 57(4): 1–21. https://doi.org/10.1080/00220388.2020.1808196
83. **Chazali, C., Ambarwati, A., Huijsmans, R. & White, B.** 2024. Young farmers' access to land: Gendered pathways into and out of farming in Nigara and Langkap (West Manggarai, Indonesia). In: S. Srinivasan, ed. *Becoming a young farmer: Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 337–359. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_12
84. **Chinsinga, B. & Chasukwa, M.** 2012. Youth, agriculture and land grabs in Malawi. *IDS Bulletin*, 43(6): 67–77. https://doi.org/10.1111/j.1759-5436.2012.00380.x
85. **Elmhirst, R., Siscawati, M., Basnett, B.S. & Ekowati, D.** 2017. Gender and generation in engagements with oil palm in East Kalimantan, Indonesia: Insights from feminist political ecology. *The Journal of Peasant Studies*, 44(6): 1135–1157. https://doi.org/10.1080/03066150.2017.1337002
86. **Kobusingye, D.N.** 2020. African youths; the forgotten category in land governance. A case study of post-conflict Acholi Region, Northern Uganda. *Geoforum*, 109: 135–142. https://doi.org/10.1016/j.geoforum.2018.06.008
87. **Miller, D.C., Cheek, J.Z., Mansourian, S. & Wildburger, C.** 2022. Forests, trees and the eradication of poverty. *Forest Policy and Economics*, 140: 102753. https://doi.org/10.1016/j.forpol.2022.102753
88. **Sunderlin, W.D., Angelsen, A., Belcher, B., Burgers, P., Nasi, R., Santoso, L. & Wunder, S.** 2005. Livelihoods, forests, and conservation in developing countries: An overview. *World Development*, 33(9): 1383–1402. https://doi.org/10.1016/j.worlddev.2004.10.004
89. **Pritchard, R., Grundy, I.M., Van Der Horst, D., Dzobo, N. & Ryan, C.M.** 2020. Environmental resources as "last resort" coping strategies following harvest failures in Zimbabwe. *World Development*, 127: 104741. https://doi.org/10.1016/j.worlddev.2019.104741
90. **Wunder, S., Angelsen, A. & Belcher, B.** 2014. Forests, Livelihoods, and conservation: Broadening the empirical base. *World Development*, 64: S1–S11. https://doi.org/10.1016/j.worlddev.2014.03.007
91. **FAO**. 2020. *Global Forest Resources Assessment 2020: Main report.* Rome. https://doi.org/10.4060/ca9825en
92. **FAO**. 2022. *The State of the World's Forests 2022. Forest pathways for green recovery and building inclusive, resilient and sustainable economies*. Rome. https://doi.org/10.4060/cb9360en
93. **Brown, H.C.P.** 2021. Youth, migration and community forestry in the Global South. *Forests, Trees and Livelihoods*, 30(3): 213–225. https://doi.org/10.1080/14728028.2021.1958065
94. **MacNeil, C., Brown, H.C.P. & Sonwa, D.J.** 2017. Investigations of the livelihood strategies of young men and women in forested landscapes of eastern Cameroon. *The International Forestry Review*, 19(4): 437–448. www.jstor.org/stable/44709344
95. **Park, C.M.Y.** 2021. Gender and generation in rural politics in Myanmar: A missed space for (re)negotiation? *The Journal of Peasant Studies*, 48(3): 560–585. https://doi.org/10.1080/03066150.2020.1837778
96. **Robson, J.P., Sosa Pérez, F. & Sanchez Luja, M.** 2019. Exploring youth-community-forest linkages in rural Mexico. *World Development Perspectives*, 16: 100140. https://doi.org/10.1016/j.wdp.2019.100140
97. **Sarigumba, M.P., Soriano, M., Robson, J.P., Quiviquivi, I. & Cabrera, O.L.** 2023. Understanding the role of youth in Indigenous territorial governance. *Frontiers in Environmental Science*, 11: 1200434. https://doi.org/10.3389/fenvs.2023.1200434
98. **Han, H. & Ahn, S.W.** 2020. Youth mobilization to stop global climate change: Narratives and impact. *Sustainability*, 12(10): 4127. https://doi.org/10.3390/su12104127
99. **Sithole, S.S., Walters, G.M., Mbatha, P. & Matose, F.** 2024. Youth engagement in global conservation governance. *Conservation Biology*, 38(6): e14387. https://doi.org/10.1111/cobi.14387
100. **Yona, L., Dixon, M.D., Howarth, R.B., Kapuscinski, A.R. & Virginia, R.A.** 2020. Applying a leverage points framework to the United Nations climate negotiations: The (dis)empowerment of youth participants. *Elementa: Science of the Anthropocene*, 8: 36. https://doi.org/10.1525/elementa.433
101. **Agarwal, B.** 2009. Gender and forest conservation: The impact of women's participation in community forest governance. *Ecological Economics*, 68(11): 2785–2799. https://doi.org/10.1016/j.ecolecon.2009.04.025
102. **Agarwal, B.** 2010. Does women's proportional strength affect their participation? Governing local forests in South Asia. *World Development*, 38(1): 98–112. https://doi.org/10.1016/j.worlddev.2009.04.001

103. **Coleman, E.A. & Mwangi, E.** 2013. Women's participation in forest management: A cross-country analysis. *Global Environmental Change*, 23(1): 193–205. https://doi.org/10.1016/j.gloenvcha.2012.10.005
104. **Robson, J.P., Wilson, S.J., Sanchez, C.M. & Bhatt, A.** 2020. Youth and the future of community forestry. *Land*, 9(11): 406. https://doi.org/10.3390/land9110406
105. **Piabuo, S.M., Foundjem-Tita, D. & Minang, P.A.** 2018. Community forest governance in Cameroon: A review. *Ecology and Society*, 23(3): art34. https://doi.org/10.5751/ES-10330-230334
106. **Barreau, A., Ibarra, J.T., Wyndham, F.S., Rojas, A. & Kozak, R.A.** 2016. How can we teach our children if we cannot access the forest? Generational change in Mapuche knowledge of wild edible plants in Andean temperate ecosystems of Chile. *Journal of Ethnobiology*, 36(2): 412–432. https://doi.org/10.2993/0278-0771-36.2.412
107. **FAO**. 2024. *The State of the World's Forests 2024. Forest-sector innovations towards a more sustainable future*. Rome. https://doi.org/10.4060/cd1211en
108. **Nchanji, E.B., Kamunye, K. & Ageyo, C.** 2023. Thematic evidencing of youth-empowering interventions in livestock production systems in sub-Sahara Africa: A systematic review. *Frontiers in Sustainable Food Systems*, 7. https://doi.org/10.3389/fsufs.2023.1176652
109. **Sulo, T., Chumo, C., Tuitoek, D. & Iagat, J.** 2012. Assessment of youth opportunities in the dairy sector in Uasin Gishu county, Kenya. *Journal of Emerging Trends in Economics and Management Sciences*, 3(4): 332–338. https://doi.org/10.10520/EJC126576
110. **Mutua, E., Bukachi, S., Bett, B., Estambale, B. & Nyamongo, I.** 2017. Youth participation in smallholder livestock production and marketing. *IDS Bulletin*, 48(3). https://doi.org/10.19088/1968-2017.129
111. **Galiè, A., Teufel, N., Girard, A.W., Baltenweck, I., Dominguez-Salas, P., Price, M.J., Jones, R. *et al.*** 2019. Women's empowerment, food security and nutrition of pastoral communities in Tanzania. *Global Food Security*, 23: 125–134. https://doi.org/10.1016/j.gfs.2019.04.005
112. **Njiru, N., Galiè, A., Omondi, I., Omia, D., Loriba, A. & Awin, P.** 2024. Gender transformative innovation: Women's inclusion in livestock vaccine systems in Northern Ghana. *Agricultural Systems*, 219: 104023. https://doi.org/10.1016/j.agsy.2024.104023
113. **Omondi, I., Galiè, A., Teufel, N., Loriba, A., Kariuki, E. & Baltenweck, I.** 2022. Women's empowerment and livestock vaccination: Evidence from Peste des Petits ruminants vaccination interventions in Northern Ghana. *Animals*, 12(6): 717. https://doi.org/10.3390/ani12060717
114. **Kinati, W. & Mulema, A.A.** 2019. Gender issues in livestock production systems in Ethiopia: A literature review. *Journal of Livestock Science*, 10(2). https://doi.org/10.33259/JLivestSci.2019.66-80
115. **Kinati, W. & Mulema, A.A.** 2018. *Gender issues in livestock production in Ethiopia: A review of literature to identify potential entry points for gender responsive research and development*. Nairobi, ILRI. https://cgspace.cgiar.org/bitstream/10568/100208/1/livestockCRP_gender.pdf
116. **Mueller, B., Acero, F. & Estruch, E.** 2017. Creating employment potential in small-ruminant value chains in the Ethiopian Highlands. FAO Animal Production and Health Working Paper 16. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/ef4b2936-10aa-43f3-b009-a22d9201cf83/content
117. **Endris, G.S., Wordofa, M.G., Aweke, C.S., Hassen, J.Y., Hussien, J.W., Moges, D.K., Sileshi, M. *et al.*** 2022. A review of the socio-ecological and institutional contexts for youth livelihood transformation in Miesso Woreda, Eastern Ethiopia. *Cogent Social Sciences*, 8(1): 2152210. https://doi.org/10.1080/23311886.2022.2152210
118. **Arulingam, I., Nigussie, L., Senaratna Sellamuttu, S. & Debevec, L.** 2019. *Youth participation in small-scale fisheries, aquaculture and value chains in Africa and the Asia-Pacific*. Penang, Malaysia, CGIAR Research Program on Fish Agri-Food Systems. https://hdl.handle.net/10568/108010
119. **Hishamunda, N., Bueno, P., Menezes, A.M., Ridler, N., Wattage, P., Martone, E. & Fisheries and Aquaculture Management Division**. 2014. *Improving governance of aquaculture employment: A global assessment*. FAO Fisheries and Aquaculture Technical Papers. Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/i3128e
120. **Nuruzzaman, M., Selim, S.U.M. & Miah, M.H.** 2014. Rights, benefits and social justice: Status of women workers engaged in the shrimp processing industries of Bangladesh. *Asian Fisheries Science*, 27(Special Gender in Aquaculture and Fisheries: Navigating Change): 151–163.
121. **Rai, S., Thilsted, S.H., Shrestha, M.K., Wahab, M.A. & Gupta, M.C.** 2014. Carp-SIS Polyculture: A new intervention to improve women's livelihoods, income and nutrition in Terai, Nepal. *Asian Fisheries Science*, 27(Special Gender in Aquaculture and Fisheries: Navigating Change): 165–174.
122. **Al Rashdi, K.M. & Mclean, E.** 2014. Contribution of small-scale fisheries to the livelihoods of Omani Women: A case study of the Al Wusta Governorate. *Asian Fisheries Science*, 27(Special Gender in Aquaculture and Fisheries: Navigating Change): 135–149.
123. **Fry, C., Arulingam, I., Nigussie, L., Senaratna Sellamuttu, S., Beveridge, M. & Marwaha, N.** 2021. *Youth in small-scale fisheries and aquaculture*. Programme Brief: FISH-2021-05. Penang, Malaysia, CGIAR Research Program on Fish Agri-Food Systems. https://digitalarchive.worldfishcenter.org/server/api/core/bitstreams/069f50f5-f91d-4f17-ac5c-dee937d86eb8/content
124. **Munene, B. & Wanjiku, A.** 2020. *Contribution of fisheries to job creation among the youth in Kenya*. KIPPRA Discussion Paper No. 233. Nairobi, Kenya Institute for Public Policy Research and Analysis.
125. **Kobusingye, L.** 2024. Gender specific analysis and mapping of the African catfish value chain in Uganda: A focus on women's roles and opportunities. Presentation at the 2024 AFRAQ conference.
126. **Espinoza-Tenorio, A., Ehuan-Noh, R.G., Cuevas-Gómez, G.A., Narchi, N.E., Ramos-Muñoz, D.E., Fernández-Rivera Melo, F.J., Saldívar-Moreno, A. *et al.*** 2022. Between uncertainty and hope: Young leaders as agents of change in sustainable small-scale fisheries. *Ambio*, 51(5): 1287–1301. https://doi.org/10.1007/s13280-021-01639-2
127. **Suh, N.N., Efed, B.T. & Nyiawung, R.A.** 2023. Youth recruitment and retainment in small-scale fisheries: Factors influencing succession and participation decisions in Cameroon. *Aquaculture, Fish and Fisheries*, 3(5): 424–434. https://doi.org/10.1002/aff2.129
128. **Suh, N.N. & Nyiawung, R.A.** 2023. Climate change dynamics and youth participation decisions in aquatic food systems: Case of the oyster sector in The Gambia, West Africa. *Marine Policy*, 156: 105804. https://doi.org/10.1016/j.marpol.2023.105804
129. **Murar, H.K.** 2024. *Deep dive*. Chenna and Geneva, International Collective in Support of Fishworkers. https://icsf.net/wp-content/uploads/2025/01/Yemaya-70_Deep-dive.pdf
130. **UNESCO (The United Nations Educational, Scientific and Cultural Organization)**. undated. UNESCO – Culture of Jeju Haenyeo (women divers). *UNESCO*. Paris. [Cited 13 March 2025]. https://ich.unesco.org/en/RL/culture-of-jeju-haenyeo-women-divers-01068
131. **Henderson, E**. 2024. A new generation of Haenyeo. In: *Erin Henderson Media*. [Cited 13 March 2025]. www.erinhendersonmedia.com/blog/a-new-generation-of-haenyeo
132. **Demirgüç-Kunt, A., Klapper, L., Singer, D. & Ansar, S.** 2021. *Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. Washington, DC, World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/37578/9781464818974.pdf
133. **Buchenau, J., Benni, N. & Cungu, A.** 2024. *Enabling markets of financial services for the rural youth*. Rome, FAO; Bonn, Germany, GIZ. https://doi.org/10.4060/cd3509en
134. **Pecorari, N., Deshpande, R. & Koning, A.** 2024. Decoding financial inclusion gaps between young men and women. *CGAP*. Washington, DC. [Cited 9 December 2024]. www.cgap.org/blog/decoding-financial-inclusion-gaps-between-young-men-and-women
135. **Deshpande, R., Koning, A. & Tan, L.** 2024. Financially including young women: Gains for a generation. *CGAP*. Washington, DC. [Cited 3 March 2025]. www.cgap.org/blog/financially-including-young-women-gains-for-generation
136. **Ebuoma, I., Gravesteijn, R. & Rutherford, S.** 2018. *Mobile money behaviour in Bangladesh: Taking the national and local perspectives*. New York, USA, United Nations Capital Development Fund (UNCDF). https://express.adobe.com/page/EXU0ivlUb1eJQ/?red=a
137. **Trendov, N.M., Varas, S. & Zeng, M.** 2019. *Digital technologies in agriculture and rural areas*. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/885161de-dccf-4589-8376-07fe37b68799/content

138. **FAO**. 2023. *Guide on digital agricultural extension and advisory services: Use of smartphone applications by smallholder farmers*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/f188cc38-d16e-4da6-adc5-45e1dc0ac96d/content

139. **Kansiime, M.K., Alawy, A., Allen, C., Subharwal, M., Jadhav, A. & Parr, M.** 2019. Effectiveness of mobile agri-advisory service extension model: Evidence from Direct2Farm program in India. *World Development Perspectives*, 13: 25–33. https://doi.org/10.1016/j.wdp.2019.02.007

140. **Alhassan, Y.J., Muhammad, A.M. & Chari, A.D.** 2023. Social media usage and agricultural extension service delivery. Implications for effectiveness in Northwest Nigeria. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 28(1): 53–60. https://doi.org/10.14738/dafs.105.13870

141. **Gow, G.A., Dissanayeke, U., Chowdhury, A. & Ramjattan, J.** 2024. Digital literacy and agricultural extension in the Global South. In: D. Radovanović, ed. *Digital literacy and inclusion*. pp. 129–144. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-30808-6_9

142. **Saravanan, R. & Suchiradipta, B.** 2016. *Social media policy guidelines for agricultural extension and advisory services*. GRFRAS Interest Group on ICT4RAS. Lindau, Switzerland, Global Forum for Rural Advisory Services: 9–11. www.g-fras.org/en/knowledge/gfras-publications.html?download=414:social-media-shaping-the-future-of-agricultural-extension-and-advisory-services

143. **Davis, K. & Franzel, S.** 2019. Engaging youth in agricultural extension and advisory services. *CGIAR/Research Program on Policies, Institutions, and Markets*. [Cited 9 December 2024]. https://pim.cgiar.org/2019/09/20/engaging-youth-in-agricultural-extension-and-advisory-services

144. **Irungu, K.R.G., Mbugua, D. & Muia, J.** 2015. Information and communication technologies (ICTs) attract youth into profitable agriculture in Kenya. *East African Agricultural and Forestry Journal*, 81(1): 24–33. https://doi.org/10.1080/00128325.2015.1040645

145. **OECD (Organisation for Economic Co-operation and Development)**. 2018. *The future of rural youth in developing countries: Tapping the potential of local value chains*. Paris, OECD Publishing. http://dx.doi.org/10.1787/9789264298521-en

146. **Aker, J.C.** 2019. *Information and communication technologies and rural youth*. Papers of the 2019 Rural Development Report. Rome, IFAD. www.ifad.org/documents/d/new-ifad.org/12_aker_2019_rdr-background-paper-pdf

147. **UNICEF & ITU (International Telecommunication Union)**. 2020. How many children and young people have internet access at home? Estimating digital connectivity during the COVID-19 pandemic. *UNICEF*. New York, USA. [Cited 12 September 2024]. https://data.unicef.org/resources/children-and-young-people-internet-access-at-home-during-covid19

148. **GSMA**. 2024. *The State of Mobile Internet Connectivity Report 2024*. London, GSMA. www.gsma.com/r/wp-content/uploads/2024/10/The-State-of-Mobile-Internet-Connectivity-Report-2024.pdf?utm_source=website&utm_medium=button&utm_campaign=somic24

149. **Mabiso, A. & Benfica, R.** 2019. The narrative on rural youth and economic opportunities in Africa: Facts, myths and gaps. *IFAD Research Series*, 61: 78. http://dx.doi.org/10.2139/ssrn.3567001

150. **Geng, L., Hui, H., Liang, X., Yan, S. & Xue, Y.** 2023. Factors affecting intention toward ICT adoption in rural entrepreneurship: Understanding the differences between business types of organizations and previous experience of entrepreneurs. *Sage Open*, 13(3): 21582440231197112. https://doi.org/10.1177/21582440231197112

151. **Hernandez, K., Flynn, J., He, J. & Alsahi, H.** 2024. *Towards digital inclusion in rural transformation*. Rome, FAO. https://doi.org/10.4060/cc9816en

152. **UNICEF**. 2023. *Bridging the gender digital divide: Challenges and an urgent call for action for equitable digital skills development*. New York, USA, UNICEF. https://data.unicef.org/resources/ictgenderdivide

153. **Livingstone, S., Nandi, A., Banaji, S. & Stoilova, M.** 2017. *Young adolescents and digital media: Uses, risks and opportunities in low-and middle-income countries: A rapid evidence review*. London, Gage. https://eprints.lse.ac.uk/83753

154. **Rehman Khan, S.A., Yu, Z., Sarwat, S., Godil, D.I., Amin, S. & Shujaat, S.** 2022. The role of block chain technology in circular economy practices to improve organisational performance. *International Journal of Logistics Research and Applications*, 25(4–5): 605–622. https://doi.org/10.1080/13675567.2021.1872512

155. **Richardson, F., Kolade, O. & Omotizi, M.** 2024. *Value chain analysis of social agriculture in Nigeria*. Farnham, UK, Caribou Digital Publishing. www.platformlivelihoods.com/wp-content/uploads/2024/04/Social-Ag-Nigeria-DIGITAL-1.pdf

156. **Chuang, J-H., Wang, J-H. & Liang, C.** 2020. Implementation of Internet of Things depends on intention: Young farmers' willingness to accept innovative technology. *International Food and Agribusiness Management Review*, 23(2): 253–266. https://doi.org/10.22434/IFAMR2019.0121

157. **Tauzie, M., Hermans, T.D.G. & Whitfield, S.** 2024. The new achikumbe elite: Food systems transformation in the context of digital platforms use in agriculture in Malawi. *Agriculture and Human Values*, 41(2): 475–489. https://doi.org/10.1007/s10460-023-10494-8

158. **Heifer International**. 2021. *The future of Africa's agriculture – an assessment of the role of youth and technology*. Little Rock, AR. https://media.heifer.org/About_Us/Africa-Agriculture-Tech-2021.pdf

159. **Boateng, R., Budu, J., Marfo, J.S., Penu, O.K.A. & Asamoah, P.** 2024. *Social agriculture: How social media is reshaping agriculture value chains in Ghana*. Farnham, UK, Caribou Digital Publishing. www.platformlivelihoods.com/social-agriculture-in-ghana

160. **Kumar, A., Yadav, R., Saikanth, D.R.K., Tripathi, G., Sharma, A., Meinam, M. & Shukla, A.** 2023. The impact of social media on agricultural youth: Empowering the next generation in India. *Asian Journal of Agricultural Extension, Economics & Sociology*, 41(10): 260–267. https://doi.org/10.9734/ajaees/2023/v41i102167

161. **Lohento, K. & Ajilore, O.** 2015. ICT and youth in agriculture. In: *Africa Agriculture Status Report 2015: Youth in agriculture in sub-Saharan Africa*. pp. 118–142. Nairobi, AGRA.

162. **Kaumbutho, P. & Takeshima, H.** 2023. Mechanization of agricultural production in Kenya: Current state and future outlook. In: C. Breisinger, M. Keenan, J. Mbuthia and J. Njuki, eds. *Food systems transformation in Kenya: Lessons from the past and policy options for the future*. Washington, DC. International Food Policy Research Institute. https://cgspace.cgiar.org/items/40f27b96-8be9-459d-bfde-6bb606400d5c

163. **TAAT (Technologies for African Agricultural Transformation)** 2022. *Small scale farm mechanization catalogue: Clearinghouse technical report series 015*. Benin, Technologies for African Agricultural Transformation. https://hdl.handle.net/10568/135272

164. **Kaumbutho, P.G.** 2016. *Elements contributing to the framework for sustainable agricultural mechanization strategies for the East Africa Sub-region*. Addis Ababa, FAO Sub-regional Office for Eastern Africa.

165. **FAO**. 2022. *The State of Food and Agriculture 2022. Leveraging automation in agriculture for transforming agrifood systems*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/1c329966-521a-4277-83d7-07283273b64b/content/cb9479en.html

166. **Meng, Y.U.E., Li, W.J., Shan, J.I.N., Jing, C., Chang, Q., Glyn, J., Cao, Y.Y. *et al.*** 2023. Farmers' precision pesticide technology adoption and its influencing factors: Evidence from apple production areas in China. *Journal of Integrative Agriculture*, 22(1): 292–305.

167. **Kassie, M., Jaleta, M., Shiferaw, B., Mmbando, F. & Mekuria, M.** 2013. Adoption of interrelated sustainable agricultural practices in smallholder systems: Evidence from rural Tanzania. *Technological Forecasting and Social Change*, 80(3): 525–540. https://doi.org/10.1016/j.techfore.2012.08.007

168. **Nyondo, C.J., Nyirenda, Z.B., Munthali, B.D. & Puerto, S.** 2023. Measuring the heterogeneous effects of input subsidies on household outcomes: Evidence from Malawi. Food Security Policy Research, Capacity, and Influence (PRCI) Research Paper 14. East Lansing, MI, Michigan State University. www.canr.msu.edu/prci/publications/MwAPATA_TEAM_STAAARS+%20PAPER_02_07_2023.pdfwww.canr.msu.edu/prci/publications/MwAPATA_TEAM_STAAARS+%20PAPER_02_07_2023.pdf

169. **Kiprono, P. & Matsumoto, T.** 2018. Roads and farming: The effect of infrastructure improvement on agricultural intensification in South-Western Kenya. *Agrekon*, 57(3–4): 198–220. https://doi.org/10.1080/03031853.2018.1518149

170. **Lucas, K., Mattioli, G., Verlinghieri, E. & Guzman, A.** 2016. Transport poverty and its adverse social consequences. *Proceedings of the Institution of Civil Engineers – Transport*, 169(6): 353–365. https://doi.org/10.1680/jtran.15.00073

171. **Porter, G. & Turner, J.** 2019. Meeting young people's mobility and transport needs: Review and prospect. *Sustainability*, 11(22): 6193. https://doi.org/10.3390/su11226193

172. **Lei, L., Desai, S. & Vanneman, R.** 2019. The impact of transportation infrastructure on women's employment in India. *Feminist Economics*, 25(4): 94–125. https://doi.org/10.1080/13545701.2019.1655162

173. **Mordi, C., Simpson, R., Singh, S. & Okafor, C.** 2010. The role of cultural values in understanding the challenges faced by female entrepreneurs in Nigeria. *Gender in Management: An International Journal*, 25(1): 5–21. https://doi.org/10.1108/17542411011019904

174. **Sobti Rajpal, P., Ghosh, A., Zaidi, M. & Sekharan, A.** 2024. *A safety audit of rural public spaces in Gujarat: Negotiating safe spaces for women and girls*. New Delhi, Institute of Social Studies Trust. https://utthangujarat.org/pdf_file/Final-%20Safety%20of%20women%20in%20rural%20public%20spaces%20_Final_Sept_09.pdf

175. **Porter, G.** 2011. "I think a woman who travels a lot is befriending other men and that's why she travels": Mobility constraints and their implications for rural women and girls in sub-Saharan Africa. *Gender, Place & Culture*, 18(1): 65–81. https://doi.org/10.1080/0966369X.2011.535304

CHAPTER 4

1. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series 23–34. Rome, FAO. www.fao.org/documents/card/en/c/cc4337en

2. **Schneider, K.R., Fanzo, J., Haddad, L., Herrero, M., Moncayo, J.R., Herforth, A., Remans, R. *et al.*** 2023. The state of food systems worldwide in the countdown to 2030. *Nature Food*, 4(12): 1090–1110. https://doi.org/10.1038/s43016-023-00885-9

3. **Davis, B., Lipper, L. & Winters, P.** 2022. Do not transform food systems on the backs of the rural poor. *Food Security*. https://doi.org/10.1007/s12571-021-01214-3

4. **Glover, D. & Sumberg, J.** 2020. Youth and food systems transformation. *Frontiers in Sustainable Food Systems*, 4. https://doi.org/10.3389/fsufs.2020.00101

5. **Christiaensen, L., Rutledge, Z. & Taylor, J.E.** 2021. Viewpoint: The future of work in agri-food. *Food Policy*, 99: 101963. https://doi.org/10.1016/j.foodpol.2020.101963

6. **Townsend, R., Benfica, R., Prasann, A. & Lee, M.** 2017. *Future of food: Shaping the food system to deliver jobs*. Washington, DC, World Bank Group.

7. **Berdegué, J.A., Trivelli, C. & Vos, R.** 2025. Employment impacts of agrifood system innovations and policies: A review of the evidence. *Global Food Security*, 44: 100832. https://doi.org/10.1016/j.gfs.2025.100832

8. **Meemken, E-M., Charlton, D., Christiaensen, L., Maertens, M., Oya, C., Reardon, T. & Stemmler, H.** 2024. Better data for decent work in the global food system. *Nature Food*, 5(6): 454–456. https://doi.org/10.1038/s43016-024-01002-0

9. **Zorn, A.** 2025. The structure of ageing in Swiss agriculture. *Journal of Rural Studies*, 115: 103574. https://doi.org/10.1016/j.jrurstud.2025.103574

10. **Rigg, J., Phongsiri, M., Promphakping, B., Salamanca, A. & Sripun, M.** 2020. Who will tend the farm? Interrogating the ageing Asian farmer. *The Journal of Peasant Studies*, 47(2): 306–325. https://doi.org/10.1080/03066150.2019.1572605

11. **Ryan, M.** 2023. *Labour and skills shortages in the agro-food sector*. OECD Food, Agriculture and Fisheries Paper 189. Paris, OECD Publishing.

12. **Ren, C., Zhou, X., Wang, C., Guo, Y., Diao, Y., Shen, S., Reis, S. *et al.*** 2023. Ageing threatens sustainability of smallholder farming in China. *Nature*, 616(7955): 96–103. https://doi.org/10.1038/s41586-023-05738-w

13. **Coopmans, I., Dessein, J., Accatino, F., Antonioli, F., Gavrilescu, C., Gradziuk, P., Manevska-Tasevska, G. *et al.*** 2020. Policy directions to support generational renewal in European farming systems. *EuroChoices*, 19(2): 30–36. https://doi.org/10.1111/1746-692X.12282

14. **McMillan, M. & Headey, D.** 2014. Introduction: Understanding structural transformation in Africa. *World Development*, 63: 1–10. https://doi.org/10.1016/j.worlddev.2014.02.007

15. **Leavy, J. & Hossain, N.** 2014. Who wants to farm? Youth aspirations, opportunities and rising food prices. *IDS Working Papers*, 2014(439): 1–44. https://doi.org/10.1111/j.2040-0209.2014.00439.x

16. **LaRue, K., Daum, T., Mausch, K. & Harris, D.** 2021. Who wants to farm? Answers depend on how you ask: A case study on youth aspirations in Kenya. *The European Journal of Development Research*. https://doi.org/10.1057/s41287-020-00352-2

17. **Sumberg, J., Yeboah, T., Flynn, J. & Anyidoho, N.A.** 2017. Young people's perspectives on farming in Ghana: A Q study. *Food Security*, 9(1): 151–161. https://doi.org/10.1007/s12571-016-0646-y

18. **White, B.** 2012. Agriculture and the generation problem: Rural youth, employment and the future of farming. *IDS Bulletin*, 43(6): 9–19. https://doi.org/10.1111/j.1759-5436.2012.00375.x

19. **White, B.** 2019. *Rural youth, today and tomorrow*. IFAD Research Series 48. Rome, IFAD. www.ifad.org/documents/d/new-ifad.org/08_white_2019-rdr-background-paper-pdf

20. **Kosec, K., Ghebru, H., Holtemeyer, B., Mueller, V. & Schmidt, E.** 2018. The effect of land access on youth employment and migration decisions: Evidence from rural Ethiopia. *American Journal of Agricultural Economics*, 100(3): 931–954. https://doi.org/10.1093/ajae/aax087

21. **Kidido, J.K., Bugri, J.T. & Kasanga, R.K.** 2017. Dynamics of youth access to agricultural land under the customary tenure regime in the Techiman traditional area of Ghana. *Land Use Policy*, 60: 254–266. https://doi.org/10.1016/j.landusepol.2016.10.040

22. **ILO**. 2024. ILOSTAT. In: *ILOSTAT*. [Cited 5 July 2024]. https://ilostat.ilo.org

23. **Zhang, Q.F. & Wu, M.** 2024. The decline and transformation of smallholders in Chinese agriculture: National trends. *The Journal of Peasant Studies*: 1–28. https://doi.org/10.1080/03066150.2024.2392688

24. **Debonne, N., Bürgi, M., Diogo, V., Helfenstein, J., Herzog, F., Levers, C., Mohr, F. *et al.*** 2022. The geography of megatrends affecting European agriculture. *Global Environmental Change*, 75: 102551. https://doi.org/10.1016/j.gloenvcha.2022.102551

25. **Maiga, E., Christiaensen, L. & Palacios-Lopez, A.** 2005. *Are the Youth Exiting Agriculture en Mass?* www.youthpower.org/sites/default/files/YouthPower/resources/Are%20the%20Youth%20Exiting%20Agriculture%20en%20Masse.pdf

26. **Brunckhorst, B., Cojocaru, A., Kim, Y.S. & Kugler, M.** 2024. Long COVID: The evolution of household welfare in developing countries during the pandemic. *World Development*, 175: 106485. https://doi.org/10.1016/j.worlddev.2023.106485

27. **Msangi, H.A., Waized, B., Ndyetabula, D.W. & Manyong, V.M.** 2024. Promoting youth engagement in agriculture through land titling programs: Evidence from Tanzania. *Heliyon*, 10(7): e29074. https://doi.org/10.1016/j.heliyon.2024.e29074

28. **Yeboah, T. & Flynn, J.** 2021. *Rural youth employment in Africa: An evidence review*. Evidence Synthesis Paper Series 10/2021. INCLUDE Knowledge Platform.

29. **Haws, A., Just, D.R. & Price, J.** undated. Who (actually) gets the farm? Intergenerational farm succession in the United States. *American Journal of Agricultural Economics*, 107(1): 3–26. https://doi.org/10.1111/ajae.12493

30. **Zagata, L. & Sutherland, L-A.** 2015. Deconstructing the "young farmer problem in Europe": Towards a research agenda. *Journal of Rural Studies*, 38: 39–51. https://doi.org/10.1016/j.jrurstud.2015.01.003

31. **Jayachandran, S.** 2021. Social norms as a barrier to women's employment in developing countries. *IMF Economic Review*, 69: 576–595. https://doi.org/10.1057/s41308-021-00140-w

32. **FAO**. 2023. *The status of women in agrifood systems*. Rome. https://doi.org/10.4060/cc5343en

33. **Dolislager, M., Reardon, T., Arslan, A., Fox, L., Liverpool-Tasie, S., Sauer, C. & Tschirley, D.L.** 2020. Youth and adult agrifood system employment in developing

regions: Rural (peri-urban to hinterland) vs. urban. *The Journal of Development Studies*: 1–23. https://doi.org/10.1080/00220388.2020.1808198

34. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport
35. **Srinivasan, S. & White, B.** 2024. Introduction: Young people's pathways into farming. In: S. Srinivasan, ed. *Becoming a young farmer: Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 1–22. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_1
36. **FAO & ILO**. 2021. *Tackling child labour through decent youth employment in agri-food systems*. Rome, Geneva. https://doi.org/10.4060/cb7441en
37. **Reardon, T., Liverpool-Tasie, L.S.O. & Minten, B.** 2021. Quiet revolution by SMEs in the midstream of value chains in developing regions: Wholesale markets, wholesalers, logistics, and processing. *Food Security*, 13(6): 1577–1594. https://doi.org/10.1007/s12571-021-01224-1
38. **Liverpool-Tasie, L.S.O., Wineman, A., Young, S., Tambo, J., Vargas, C., Reardon, T., Adjognon, G.S. *et al.*** 2020. A scoping review of market links between value chain actors and small-scale producers in developing regions. *Nature Sustainability*, 3(10): 799–808. https://doi.org/10.1038/s41893-020-00621-2
39. **Vos, R. & Cattaneo, A.** 2020. Smallholders and rural people: Making food system value chains inclusive. In: *2020 Global Food Policy Report*. Chapter 2. pp. 14–27. Washington, DC, International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/9780896293670_02
40. **Reardon, T., Echeverria, R., Berdegué, J., Minten, B., Liverpool-Tasie, S., Tschirley, D. & Zilberman, D.** 2019. Rapid transformation of food systems in developing regions: Highlighting the role of agricultural research & innovations. *Agricultural Systems*, 172: 47–59. https://doi.org/10.1016/j.agsy.2018.01.022
41. **Charlton, D., Rutledge, Z. & Taylor, J.E.** 2021. Evolving agricultural labor markets. In: C.B. Barrett & D.R. Just, eds. *Handbook of Agricultural Economics*. pp. 4075–4133. Vol. 5.Amsterdam, Netherlands, Elsevier. https://doi.org/10.1016/bs.hesagr.2021.10.003
42. **FAO**. 2022. *The State of Food and Agriculture 2022*. Rome. https://doi.org/10.4060/cb9479en
43. **Yami, M., Feleke, S., Abdoulaye, T., Alene, A.D., Bamba, Z. & Manyong, V.** 2019. African rural youth engagement in agribusiness: Achievements, limitations, and lessons. *Sustainability*, 11(1): 185. https://doi.org/10.3390/su11010185
44. **ILO**. 2019. *Small matters. Global evidence on the contribution to employment by the self-employed, micro-enterprises and SMEs*. Geneva. www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_723282.pdf
45. **Nagler, P. & Naudé, W.** 2017. Non-farm entrepreneurship in rural sub-Saharan Africa: New empirical evidence. *Food Policy*, 67: 175–191. https://doi.org/10.1016/j.foodpol.2016.09.019
46. **Nagler, P. & Naudé, W.** 2014. Non-farm entrepreneurship in rural Africa: Patterns and determinants. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2406330
47. **Bruhn, M. & McKenzie, D.** 2014. Entry regulation and the formalization of microenterprises in developing countries. *The World Bank Research Observer*, 29(2): 186–201. https://doi.org/10.1093/wbro/lku002
48. **Gukurume, S.** 2018. Navigating precarious livelihoods: Youth in the SME sector in Zimbabwe. *IDS Bulletin*, 49(5). https://doi.org/10.19088/1968-2018.176
49. **Sumberg, J., Fox, L., Flynn, J., Mader, P. & Oosterom, M.** 2021. Africa's "youth employment" crisis is actually a "missing jobs" crisis. *Development Policy Review*, 39(4): 621–643. https://doi.org/10.1111/dpr.12528
50. **OECD**. 2021. *Jobs for rural youth: The role of local food economies*. Development Centre Studies. Paris. https://doi.org/10.1787/692c0ca1-en
51. **Franzel, S., Miiro, R., Uwitonze, N., Davis, K., Luzobe, B. & Rurangwa, R.** 2020. Engaging young agripreneurs: Options to include youth in private sector extension and advisory services in Rwanda and Uganda: Executive summary. Washington, DC, USAID. https://cgspace.cgiar.org/items/74606e88-b92c-4f6d-9cdb-dd32ca066c5e
52. **Maertens, M. & Swinnen, J.F.M.** 2012. Gender and modern supply chains in developing countries. *Journal of Development Studies*, 48(10): 1412–1430. https://doi.org/10.1080/00220388.2012.663902
53. **Cattaneo, A., Girgin, S., de By, R., McMenomy, T., Nelson, A. & Vaz, S.** 2024. Worldwide delineation of multi-tier city–regions. *Nature Cities*, 1(7): 469–479. https://doi.org/10.1038/s44284-024-00083-z
54. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118
55. **Williams, A., Stuart, C., Perrin, N., Heise, L., Anglewicz, P. & Decker, M.R.** 2025. Who are the "vanguard" women? Strategies for identifying women going against economic participation norms across 49 low- and middle-income countries. *World Development*, 186: 106846. https://doi.org/10.1016/j.worlddev.2024.106846
56. **Heckert, J., Pereira, A., Doss, C., Myers, E.C. & Quisumbing, A.** 2020. Structural transformation and gendered transitions to adulthood among rural youth: Cross-national evidence from low- and middle-income countries. *The Journal of Development Studies*, 57(4): 614–634. https://doi.org/10.1080/00220388.2020.1808196
57. **Ellis, F.** 2008. The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, 51(2): 289–302. https://doi.org/10.1111/j.1477-9552.2000.tb01229.x
58. **Reardon, T.** 1997. Using evidence of household income diversification to inform study of the rural nonfarm labor market in Africa. *World Development*, 25(5): 735–747. https://doi.org/10.1016/S0305-750X(96)00137-4
59. **Alobo Loison, S.** 2015. Rural livelihood diversification in sub-Saharan Africa: A literature review. *The Journal of Development Studies*, 51(9): 1125–1138. https://doi.org/10.1080/00220388.2015.1046445
60. **Ellis, F.** 1998. Household strategies and rural livelihood diversification. *The Journal of Development Studies*, 35(1): 1–38. https://doi.org/10.1080/00220389808422553
61. **Davis, B., Di Giuseppe, S. & Zezza, A.** 2017. Are African households (not) leaving agriculture? Patterns of households' income sources in rural Sub-Saharan Africa. *Food Policy*, 67: 153–174. https://doi.org/10.1016/j.foodpol.2016.09.018
62. **Barrett, C.B., Reardon, T. & Webb, P.** 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food Policy*, 26(4): 315–331. https://doi.org/10.1016/S0306-9192(01)00014-8
63. **Davis, B., Winters, P., Carletto, G., Covarrubias, K., Quiñones, E.J., Zezza, A., Stamoulis, K. *et al.*** 2010. A cross-country comparison of rural income generating activities. *World Development*, 38(1): 48–63. https://doi.org/10.1016/j.worlddev.2009.01.003
64. **Winters, P., Essam, T., Zezza, A., Davis, B. & Carletto, C.** 2010. Patterns of rural development: A cross-country comparison using microeconomic data. *Journal of Agricultural Economics*, 61(3): 628–651. https://doi.org/10.1111/j.1477-9552.2010.00265.x
65. **Ellis, F.** 2000. The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, 51(2): 289–302. https://doi.org/10.1111/j.1477-9552.2000.tb01229.x
66. **Dickey, H. & Theodossiou, I.** 2006. Who has two jobs and why? Evidence from rural coastal communities in west Scotland. *Agricultural Economics*, 34(3): 291–301. https://doi.org/10.1111/j.1574-0864.2006.00126.x
67. **van der Ploeg, J.D. & and Jingzhong, Y.** 2010. Multiple job holding in rural villages and the Chinese road to development. *The Journal of Peasant Studies*, 37(3): 513–530. https://doi.org/10.1080/03066150.2010.494373
68. **Ames, B.D., Brosi, W.A. & Damiano-Teixeira, K.M.** 2006. "I'm just glad my three jobs could be during the day": Women and work in a rural community. *Family Relations*, 55(1): 119–131. https://doi.org/10.1111/j.1741-3729.2006.00361.x
69. **Sharma, A. & Bhaduri, A.** 2009. The "tipping point" in Indian agriculture: Understanding the withdrawal of the Indian rural youth. *Asian Journal of Agriculture and Development*, 6(1): 83–97. https://doi.org/10.37801/ajad2009.6.1.5
70. **Yeboah, T., Chigumira, E., John, I., Anyidoho, N.A., Manyong, V., Flynn, J. & Sumberg, J.** 2020. Hard work and hazard: Young people and agricultural

commercialisation in Africa. *Journal of Rural Studies*, 76: 142–151. https://doi.org/10.1016/j.jrurstud.2020.04.027

71. **FAO**. 2023. *RuLIS – Rural Livelihoods Information System.* [Cited *5* December 2023]. www.fao.org/in-action/rural-livelihoodsdataset-rulis/en
72. **Van Der Weide, R., Lakner, C., Mahler, D.G., Narayan, A. & Gupta, R.** 2024. Intergenerational mobility around the world: A new database. *Journal of Development Economics*, 166: 103167. https://doi.org/10.1016/j.jdeveco.2023.103167
73. **Ebeke, C.H.** 2023. Intergenerational mobility and the Growth–Inequality–Poverty Nexus in Africa. *Journal of African Economies*, 32(Supplement_2): ii99–ii112. https://doi.org/10.1093/jae/ejac044
74. **Losch, B.** 2022. Decent employment and the future of agriculture. How dominant narratives prevent addressing structural issues. *Frontiers in Sustainable Food Systems*, 6:862249. www.frontiersin.org/articles/10.3389/fsufs.2022.862249
75. **ILO**. 2013. *Guide to the Millennium Development Goals employment indicators*. Second edition. Geneva.
76. **ILO**. 2024. *Global Employment Trends for Youth 2024: Decent work, brighter futures*. Geneva.
77. **Lo Bue, M.C., Le, T.T.N., Santos Silva, M. & Sen, K.** 2022. Gender and vulnerable employment in the developing world: Evidence from global microdata. *World Development*, 159: 106010. https://doi.org/10.1016/j.worlddev.2022.106010
78. **Holmes, R. & Jones, N.** 2011. *Gender inequality, risk and vulnerability in the rural economy: Refocusing the public works agenda to take account of economic and social risks*. ESA Working Paper No. 11–13. Rome, FAO. https://www.fao.org/4/am318e/am318e00.pdf
79. **Nolte, K. & Ostermeier, M.** 2017. Labour market effects of large-scale agricultural investment: Conceptual considerations and estimated employment effects. *World Development*, 98: 430–446. https://doi.org/10.1016/j.worlddev.2017.05.012
80. **Van den Broeck, G., Swinnen, J. & Maertens, M.** 2017. Global value chains, large-scale farming, and poverty: Long-term effects in Senegal. *Food Policy*, 66: 97–107. https://doi.org/10.1016/j.foodpol.2016.12.003
81. **Guloba, M.M., Kakura, M., Ssewanyana, S.N. & Rauschendorfer, D.** 2021. *Employment creation potential, labor skills requirements and skill gaps for young people: A Uganda case study*. AGI Working Paper No. 37. Washington, DC, Brookings Institute. www.brookings.edu/wp-content/uploads/2021/07/21.08.02-Uganda-IWOSS.pdf
82. **de Janvry, A., Duquennois, C. & Sadoulet, E.** 2022. Labor calendars and rural poverty: A case study for Malawi. *Food Policy*, 109: 102255. https://doi.org/10.1016/j.foodpol.2022.102255
83. **McCullough, E.B.** 2017. Labor productivity and employment gaps in Sub-Saharan Africa. *Food Policy*, 67: 133–152. https://doi.org/10/f94xsm
84. **Sumberg, J., Anyidoho, N.A., Leavy, J., te Lintelo, D.J.H. & Wellard, K.** 2012. Introduction: The young people and agriculture "problem" in Africa. *IDS Bulletin*, 43(6): 1–8. https://doi.org/10.1111/j.1759-5436.2012.00374.x
85. **Sumberg, J., Holland-Szyp, C., Yeboah, T., Oosterom, M., Crossouard, B. & Chamberlin, J.** 2024. Young people, livelihood building and the transformation of African agriculture: A reality check. *Global Food Security*, 41: 100759. https://doi.org/10.1016/j.gfs.2024.100759
86. **Palacios-Lopez, A., Christiaensen, L. & Kilic, T.** 2017. How much of the labor in African agriculture is provided by women? *Food Policy*, 67: 52–63. https://doi.org/10.1016/j.foodpol.2016.09.017
87. **Palacios-López, A. & López, R.** 2015. The gender gap in agricultural productivity: The role of market imperfections. *The Journal of Development Studies*, 51(9): 1175–1192. https://doi.org/10.1080/00220388.2015.1028539
88. **Quisumbing, A.R. & Pandolfelli, L.** 2010. Promising approaches to address the needs of poor female farmers: Resources, constraints, and interventions. *World Development*, 38(4): 581–592. https://doi.org/10.1016/j.worlddev.2009.10.006
89. **Sinha, A., Kumar Sedai, A., Bahadur Rahut, D. & Sonobe, T.** 2024. Well-being costs of unpaid care: Gendered evidence from a contextualized time-use survey in India. *World Development*, 173: 106419. https://doi.org/10.1016/j.worlddev.2023.106419
90. **UNDESA**. 2025. Unpaid work. In: *New York, USA*. [Cited 1 January 2025]. https://tinyurl.com/2zyeopx4

CHAPTER 5

1. **Alaimo, K., Chilton, M. & Jones, S.J.** 2020. Food insecurity, hunger, and malnutrition. In: B.P. Marriott, D.F. Birt, V.A. Stallings & A.A. Yates, eds. *Present knowledge in nutrition (11th edition)*. pp. 311–326. New York, USA, Academic Press. https://doi.org/10.1016/B978-0-12-818460-8.00017-4
2. **Swinburn, B.A., Kraak, V.I., Allender, S., Atkins, V.J., Baker, P.I., Bogard, J.R., Brinsden, H. *et al.*** 2019. The global syndemic of obesity, undernutrition, and climate change: *The Lancet* Commission report. *The Lancet*, 393(10173): 791–846. https://doi.org/10.1016/S0140-6736(18)32822-8
3. **Kerr, J.A., Patton, G.C., Cini, K.I., Abate, Y.H., Abbas, N., Magied, A.H.A.A.A., ElHafeez, S.A. *et al.*** 2025. Global, regional, and national prevalence of child and adolescent overweight and obesity, 1990–2021, with forecasts to 2050: A forecasting study for the Global Burden of Disease Study 2021. *The Lancet*, 405(10481): 785–812. https://doi.org/10.1016/S0140-6736(25)00397-6
4. **FAO**. 2023. *The State of Food and Agriculture 2023: Revealing the true cost of food to transform agrifood systems.* Rome. https://openknowledge.fao.org/items/d8b6b6d9-4fe3-4589-8b88-cac3f9ccdf0f
5. **UNDESA (United Nations Department of Economics and Social Affairs)**. 2024. World Population Prospects – Population Division. *United Nations*. New York, USA. [Cited 22 April 2025]. https://population.un.org/wpp
6. **Arndt, C., Diao, X., Dorosh, P., Pauw, K. & Thurlow, J.** 2023. The Ukraine war and rising commodity prices: Implications for developing countries. *Global Food Security*, 36: 100680. https://doi.org/10.1016/j.gfs.2023.100680
7. **Hasegawa, T., Sakurai, G., Fujimori, S., Takahashi, K., Hijioka, Y. & Masui, T.** 2021. Extreme climate events increase risk of global food insecurity and adaptation needs. *Nature Food*, 2(8): 587–595. https://doi.org/10.1038/s43016-021-00335-4
8. **Nagata, J.M., Palar, K., Gooding, H.C., Garber, A.K., Whittle, H.J., Bibbins-Domingo, K. & Weiser, S.D.** 2019. Food insecurity is associated with poorer mental health and sleep outcomes in young adults. *Journal of Adolescent Health*, 65(6): 805–811. https://doi.org/10.1016/j.jadohealth.2019.08.010
9. **Baiden, P., Boateng, G.O., Dako-Gyeke, M., Acolatse, C.K. & Peters, K.E.** 2020. Examining the effects of household food insecurity on school absenteeism among Junior High School students: Findings from the 2012 Ghana global school-based student health survey. *African Geographical Review*, 39(2): 107–119. https://doi.org/10.1080/19376812.2019.1627667
10. **Patton-López, M.M., López-Cevallos, D.F., Cancel-Tirado, D.I. & Vazquez, L.** 2014. Prevalence and correlates of food insecurity among students attending a midsize rural university in Oregon. *Journal of Nutrition Education and Behavior*, 46(3): 209–214. https://doi.org/10.1016/j.jneb.2013.10.007
11. **Behrman, J.R.** 2008. *Early life nutrition and subsequent education, health, wage, and intergenerational effects*. Commission on Growth and Development Working Paper No. 33. Washington, DC, World Bank. http://documents.worldbank.org/curated/en/848441468176953803
12. **Nandi, A., Behrman, J.R., Kinra, S. & Laxminarayan, R.** 2018. Early-life nutrition is associated positively with schooling and labor market outcomes and negatively with marriage rates at age 20–25 years: Evidence from the Andhra Pradesh Children and Parents Study (APCAPS) in India. *Journal of Nutrition*, 148(1): 140–146. https://doi.org/10.1093/jn/nxx012
13. **Nouman, M., Khan, D., Ul Haq, I., Naz, N., Zahra, B.T.E. & Ullah, A.** 2022. Assessing the implication of green revolution for food security in Pakistan: A multivariate cointegration decomposition analysis. *Journal of Public Affairs*, 22(S1): e2758. https://doi.org/10.1002/pa.2758
14. **Reardon, T. & Timmer, C.** 2012. The economics of the food system revolution. *Annual Review of Resource Economics*, 4(1): 225–264.
15. **Masters, W.A., Finaret, A.B. & Block, S.A.** 2022. The economics of malnutrition: Dietary transition and food system transformation. In: C.B. Barrett & D.R. Just,

eds. *Handbook of agricultural economics*. Vol. 6. pp. 4997–5083. Amsterdam, Netherlands, Elsevier. https://doi.org/10.1016/bs.hesagr.2022.03.006

16. **Neufeld, L.M., Andrade, E.B., Ballonoff Suleiman, A., Barker, M., Beal, T., Blum, L.S., Demmler, K.M. *et al.*** 2022. Food choice in transition: Adolescent autonomy, agency, and the food environment. *The Lancet*, 399(10320): 185–197. https://doi.org/10.1016/S0140-6736(21)01687-1
17. **Kruger, M.J. & Nell, T.A.** 2017. Bone mineral density in people living with HIV: A narrative review of the literature. *AIDS Research and Therapy*, 14(1): 35. https://doi.org/10.1186/s12981-017-0162-y
18. **Neufeld, L., Pelletier, D.L. & Haas, J.D.** 1999. The timing of maternal weight gain during pregnancy and fetal growth. *American Journal of Human Biology*, 11(5): 627–637. https://doi.org/10.1002/(SICI)1520-6300(199909/10)11:5<627:AID-AJHB6>3.0.CO;2-X
19. **Norris, S.A., Frongillo, E.A., Black, M.M., Dong, Y., Fall, C., Lampl, M., Liese, A.D. *et al.*** 2022. Nutrition in adolescent growth and development. *The Lancet*, 399(10320): 172–184. https://doi.org/10.1016/S0140-6736(21)01590-7
20. **Kim, K.M., Jang, H.C. & Lim, S.** 2016. Differences among skeletal muscle mass indices derived from height-, weight-, and body mass index-adjusted models in assessing sarcopenia. *The Korean Journal of Internal Medicine*, 31(4): 643–650. https://doi.org/10.3904/kjim.2016.015
21. **Gee, D.G. & Casey, B.J.** 2015. The impact of developmental timing for stress and recovery. *Neurobiology of Stress*, 1: 184–194. https://doi.org/10.1016/j.ynstr.2015.02.001
22. **FAO, IFAD, UNICEF, WFP (World Food Programme) & WHO (World Health Organization)**. 2020. *The State of Food Security and Nutrition in the World 2020*. Rome. https://doi.org/10.4060/ca9692en
23. **Beal, T., Manohar, S., Miachon, L. & Fanzo, J.** 2024. Nutrient- dense foods and diverse diets are important for ensuring adequate nutrition across the life course. *Proceedings of the National Academy of Sciences*, 121(50): e2319007121. https://doi.org/10.1073/pnas.2319007121
24. **Institute of Medicine (US) Panel on Micronutrients**. 2001. *Dietary reference intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. Washington, DC, National Academies Press . www.ncbi.nlm.nih.gov/books/NBK222310
25. **WHO & FAO**. 2003. *Diet, nutrition and the prevention of chronic diseases: Report of a joint WHO/FAO expert consultation*. WHO Technical Report Series 916. Geneva, WHO. https://iris.who.int/bitstream/handle/10665/42665/WHO_TRS_916.pdf?sequence=1
26. **Bhaskaram, P.** 2002. Micronutrient malnutrition, infection, and immunity: An overview. *Nutrition Reviews*, 60(52). https://doi.org/10.1301/00296640260130722
27. **Calder, P. & Jackson, A.** 2000. Undernutrition, infection and immune function. *Nutrition Research Reviews*, 13(1): 3–29. https://doi.org/10.1079/095442200108728981
28. **Smith, T.J. & McClung, J.P.** 2021. Nutrition, immune function, and infectious disease. *Medical Journal*: 133–136.
29. **Bonjour, J-P. & Chevalley, T.** 2014. Pubertal timing, bone acquisition, and risk of fracture throughout life. *Endocrine Reviews*, 35(5): 820–847. https://doi.org/10.1210/er.2014-1007
30. **Gilsanz, V., Chalfant, J., Kalkwarf, H., Zemel, B., Lappe, J., Oberfield, S., Shepherd, J., Wren, T. & Winer, K.** 2011. Age at onset of puberty predicts bone mass in young adulthood. *The Journal of Pediatrics*, 158(1): 100–105, 105.e1–2. https://doi.org/10.1016/j.jpeds.2010.06.054
31. **Lowe, C.J., Morton, J.B. & Reichelt, A.C.** 2020. Adolescent obesity and dietary decision making: A brain-health perspective. *The Lancet. Child & Adolescent Health*, 4(5): 388–396. https://doi.org/10.1016/S2352-4642(19)30404-3
32. **Jacka, F.N.** 2021. Nutritional psychiatry: Implications for public health. *European Journal of Public Health*, 31. https://doi.org/10.1093/eurpub/ckab164.019
33. **Dash, S., O'Neil, A. & Jacka, F.N.** 2016. Diet and common mental disorders: The imperative to translate evidence into action. *Frontiers in Public Health*, 4(4): 81–81.
34. **Catalano, P. & Ehrenberg, H.** 2006. Review article: The short- and long-term implications of maternal obesity on the mother and her offspring. *BJOG: An International Journal of Obstetrics & Gynaecology*, 113(10): 1126–1133. https://doi.org/10.1111/j.1471-0528.2006.00989.x
35. **Dodd, J.M., Grivell, R.M., Nguyen, A-M., Chan, A. & Robinson, J.S.** 2011. Maternal and perinatal health outcomes by body mass index category. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51(2): 136–140. https://doi.org/10.1111/j.1479-828X.2010.01272.x
36. **Nandi, A., Ashok, A., Kinra, S., Behrman, J.R. & Laxminarayan, R.** 2015. Early childhood nutrition is positively associated with adolescent educational outcomes: Evidence from the Andhra Pradesh Child and Parents Study (APCAPS). *Journal of Nutrition*, 146(4): 806–813. https://doi.org/10.3945/jn.115.223198
37. **Maluccio, J.A., Hoddinott, J., Behrman, J.R., Martorell, R., Quisumbing, A.R. & Stein, A.D.** 2009. The impact of improving nutrition during early childhood on education among Guatemalan adults. *The Economic Journal*, 119(537): 734–763. https://doi.org/10.1111/j.1468-0297.2009.02220.x
38. **O'Neill, T. & March, R.A.** 2022. The economic costs of poor nutrition. *American Action Forum*, 9 March 2022. www.americanactionforum.org/research/the-economic-costs-of-poor-nutrition
39. **Galler, J.R., Koethe, J.R. & Yolken, R.H.** 2017. Neurodevelopment: The Impact of Nutrition and Inflammation During Adolescence in Low-Resource Settings. *Pediatrics*, 139. https://doi.org/10.1542/peds.2016-2828i
40. **Nandi, A., Bhalotra, S.R., Deolalikar, A.B. & Laxminarayan, R.** 2017. The human capital and productivity benefits of early childhood nutritional interventions. In: N. de Silva, D.A. Bundy, S. Horton, D.T. Jamison & G.C. Patton, eds. *Disease Control Priorities, Third Edition: Volume 8. Child and Adolescent Health and Development*. Chapter 27. Washington, DC, World Bank. https://doi.org/10.1596/978-1-4648-0423-6
41. **Cowan-Pyle, A.E., Bailey, R.L., Gao, J., Hess, J.M., Ademu, L.O., Smith, J.L., Mitchell, D.C. & Racine, E.F.** 2024. Dietary quality and diet-related factors among emerging adults (18–23 y) in the United States are a cause for concern: National Health and Nutrition Examination Survey 2015–2018. *The Journal of Nutrition*, 154(8): 2524–2533. https://doi.org/10.1016/j.tjnut.2024.06.015
42. **Beal, T., Morris, S.S. & Tumilowicz, A.** 2019. Global patterns of adolescent fruit, vegetable, carbonated soft drink, and fast-food consumption: A meta-analysis of global school-based student health surveys. *Food and Nutrition Bulletin*, 40(4): 444–459. https://doi.org/10.1177/0379572119848287
43. **Li, L., Sun, N., Zhang, L., Xu, G., Liu, J., Hu, J., Zhang, Z. *et al.*** 2020. Fast food consumption among young adolescents aged 12–15 years in 54 low- and middle-income countries. *Global Health Action*, 13(1): 1795438. https://doi.org/10.1080/16549716.2020.1795438
44. **Vereecken, C., Pedersen, T.P., Ojala, K., Krølner, R., Dzielska, A., Ahluwalia, N., Giacchi, M. & Kelly, C.** 2015. Fruit and vegetable consumption trends among adolescents from 2002 to 2010 in 33 countries. *European Journal of Public Health*, 25(suppl_2): 16–19. https://doi.org/10.1093/eurpub/ckv012
45. **Passarelli, S., Free, C.M., Shepon, A., Beal, T., Batis, C. & Golden, C.D.** 2024. Global estimation of dietary micronutrient inadequacies: A modelling analysis. *The Lancet Global Health*, 12(10): e1590–e1599. https://doi.org/10.1016/S2214-109X(24)00276-6
46. **Filgueiras, M.S., Rocha, N.P., Novaes, J.F. & Bressan, J.** 2020. Vitamin D status, oxidative stress, and inflammation in children and adolescents: A systematic review. *Critical Reviews in Food Science and Nutrition*, 60(4): 660–669. https://doi.org/10.1080/10408398.2018.1546671
47. **Liao, S., Omage, S.O., Börmel, L., Kluge, S., Schubert, M., Wallert, M. & Lorkowski, S.** 2022. Vitamin E and metabolic health: Relevance of interactions with other micronutrients. *Antioxidants*, 11(9): 1785. https://doi.org/10.3390/antiox11091785
48. **Singh, U., Devaraj, S. & Jialal, I.** 2005. Vitamin E, oxidative stress, an inflammation. *Annual Review of Nutrition*, 25(1): 151–174. https://doi.org/10.1146/annurev.nutr.24.012003.132446
49. **Akseer, N., Al-Gashm, S., Mehta, S., Mokdad, A. & Bhutta, Z.A.** 2017. Global and regional trends in the nutritional status of young people: A critical and neglected age group. *Annals of the New York Academy of Sciences*, 1393(1): 3–20. https://doi.org/10.1111/nyas.13336
50. **Spear, B.A.** 2002. Adolescent growth and development. *Journal of the American Dietetic Association*, 102(3 Suppl): S23-29. https://doi.org/10.1016/s0002-8223(02)90418-9
51. **Lenders, C.M., McElrath, T.F. & Scholl, T.O.** 2000. Nutrition in adolescent pregnancy. *Current Opinion in Pediatrics*, 12(3): 291–296. https://doi.org/10.1097/00008480-200006000-00021

52. **Morán, V.H.** 2007. Nutritional status in pregnant adolescents: A systematic review of biochemical markers. *Maternal and Child Nutrition*, 3(2): 74–93. https://doi.org/10.1111/j.1740-8709.2007.00081.x
53. **World Obesity Federation**. 2023. *World Obesity Atlas 2023*. London. https://data.worldobesity.org/publications/?cat=19
54. **James, W.P.T., Nelson, M., Ralph, A. & Leather, S.** 1997. Socioeconomic determinants of health: The contribution of nutrition to inequalities in health. *BMJ*, 314(7093): 1545. https://doi.org/10.1136/bmj.314.7093.1545
55. **Dowd, C., Polzin, S.S., Gleason, K., Yang, R., Narang, P. & Patel, R.** 2024. Conflict's impacts on food systems: Mapping available evidence of interactions. *Journal of International Development*, 36(4): 2152–2171. https://doi.org/10.1002/jid.3899
56. **Brück, T. & d'Errico, M.** 2019. Reprint of: Food security and violent conflict: Introduction to the special issue. *World Development*, 119: 145–149. https://doi.org/10.1016/j.worlddev.2019.04.006
57. **van Weezel, S.** 2018. *Food security and armed conflict: A cross-country analysis*. FAO Agricultural Development Economics Working Paper 18-03. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/a0e95600-a50f-4618-9f9c-16e4733be822/content
58. **Agarwal, S., Jones, E. & Verma, S.** 2016. Migrant adolescent girls in urban slums India: Aspirations, opportunities and challenges. *Indian Journal of Youth and Adolescent Health*, 3(4): 8–21. https://doi.org/10.24321/2349.2880/201601
59. **Kavian, F., Mehta, K., Willis, E., Mwanri, L., Ward, P. & Booth, S.** 2020. Migration, stress and the challenges of accessing food: An exploratory study of the experience of recent Afghan women refugees in Adelaide, Australia. *International Journal of Environmental Research and Public Health*, 17(4): 1379. https://doi.org/10.3390/ijerph17041379
60. **Sithole, S. & Dinbabo, M.F.** 2016. Exploring youth migration and the food security nexus: Zimbabwean youths in Cape Town, South Africa. *African Human Mobility Review*, 2(2). https://doi.org/10.14426/ahmr.v2i2.768
61. **Mane, E., Giaquinto, A.M., Cafiero, C., Viviani, S. & Anriquez, G.** 2025. Closing the gender gap in global food insecurity: Socioeconomic determinants and economic gains in the aftermath of COVID-19. *Global Food Security*, 45(100850). https://doi.org/10.1016/j.gfs.2025.100850
62. **Giaquinto, A.M., Mane, E., Cafiero, C. & Viviani, S.** 2024. Does age matter for food security? A focus on rural youth. Presentation at FAO Youth Report review meeting, Rome, 2 October 2024.
63. **Neely, E., Walton, M. & Stephens, C.** 2014. Young people's food practices and social relationships. A thematic synthesis. *Appetite*, 82: 50–60. https://doi.org/10.1016/j.appet.2014.07.005
64. **Kansky, J., Ruzek, E. & Allen, J.** 2017. Observing adolescent relationships. In: B. Soenens, M. Vansteenkiste & S. Van Petegem, eds. *Autonomy in adolescent development*. First edition, pp. 33–52. Abingdon, Oxon; New York, USA: Routledge/Psychology Press. https://doi.org/10.4324/9781315636511-2
65. **Allen, J.P. & Loeb, E.L.** 2015. The autonomy-connection challenge in adolescent–peer relationships. *Child Development Perspectives*, 9(2): 101–105. https://doi.org/10.1111/cdep.12111
66. **Poole, M.E. & Gelder, A.J.** 1984. Family cohesiveness and adolescent autonomy in decision-making. *Australian Journal of Sex, Marriage and Family*, 5(2): 65–75. https://doi.org/10.1080/01591487.1984.11004277
67. **Lindell, A.K. & Campione-Barr, N.** 2017. Continuity and change in the family system across the transition from adolescence to emerging adulthood. *Marriage & Family Review*, 53(4): 388–416. https://doi.org/10.1080/01494929.2016.1184212
68. **Oudekerk, B.A., Allen, J.P., Hessel, E.T. & Molloy, L.E.** 2015. The cascading development of autonomy and relatedness from adolescence to adulthood. *Child Development*, 86(2): 472–485. https://doi.org/10.1111/cdev.12313
69. **Blake, C.E., Frongillo, E.A., Warren, A.M., Constantinides, S.V., Rampalli, K.K. & Bhandari, S.** 2021. Elaborating the science of food choice for rapidly changing food systems in low-and middle-income countries. *Global Food Security*, 28: 100503. https://doi.org/10.1016/j.gfs.2021.100503
70. **Bruner, M.W., McLaren, C.D., Sutcliffe, J.T., Gardner, L.A. & Vella, S.A.** 2022. Conceptualizing and measuring positive youth development in sport: A scoping review. *International Review of Sport and Exercise Psychology*, 17(2): 1704–752. https://doi.org/10.1080/1750984X.2022.2070861
71. **Lerner, R.M., Almerigi, J.B., Theokas, C. & Lerner, J.V.** 2005. Positive youth development. A view of the issues. *The Journal of Early Adolescence*, 25(1): 10–16. https://doi.org/10.1177/0272431604273211
72. **Robinson, E., Blissett, J. & Higgs, S.** 2013. Social influences on eating: Implications for nutritional interventions. *Nutrition Research Reviews*, 26(2): 166–176. https://doi.org/10.1017/S0954422413000127
73. **Chung, S.J., Ersig, A.L. & McCarthy, A.M.** 2017. The influence of peers on diet and exercise among adolescents: A systematic review. *Journal of Pediatric Nursing*, 36: 44–56. https://doi.org/10.1016/j.pedn.2017.04.010
74. **Herr, R.S.** 2010. Agency without autonomy: Valuational agency. *Journal of Global Ethics*, 6(3): 239–254. www.tandfonline.com/doi/full/10.1080/17449626.2010.524797
75. **Fultner, B.** 2011. *Jürgen Habermas: Key concepts*. Durham, UK, Acumen.
76. **Reiter, A.M.F., Moutoussis, M., Vanes, L., Kievit, R., Bullmore, E.T., Goodyer, I.M., Fonagy, P. *et al.*** 2021. Preference uncertainty accounts for developmental effects on susceptibility to peer influence in adolescence. *Nature Communications*, 12(1): 3823. https://doi.org/10.1038/s41467-021-23671-2
77. **De Goede, I.H.A., Branje, S.J.T. & Meeus, W.H.J.** 2009. Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence*, 38(1): 75–88. https://doi.org/10.1007/s10964-008-9286-7
78. **Wray-Lake, L., Crouter, A.C. & McHale, S.M.** 2010. Developmental patterns in decision-making autonomy across middle childhood and adolescence: European American parents' perspectives. *Child Development*, 81(2): 636–651. https://doi.org/10.1111/j.1467-8624.2009.01420.x
79. **Evans, K.** 2007. Concepts of bounded agency in education, work, and the personal lives of young adults. *International Journal of Psychology*, 42(2): 85–93. https://doi.org/10.1080/00207590600991237
80. **Glover, D. & Sumberg, J.** 2020. Youth and food systems transformation. *Frontiers in Sustainable Food Systems*, 4: 101. https://doi.org/10.3389/fsufs.2020.00101
81. **ILO.** 2020. *Global Employment Trends for Youth 2020: Technology and the future of jobs*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40dcomm/%40publ/documents/publication/wcms_737648.pdf
82. **Frech, A.** 2012. Healthy behavior trajectories between adolescence and young adulthood. *Advances in Life Course Research*, 17(2): 59–68. https://doi.org/10.1016/j.alcr.2012.01.003
83. **Marquis, M.** 2005. Exploring convenience orientation as a food motivation for college students living in residence halls. *International Journal of Consumer Studies*, 29(1): 55–63. https://doi.org/10.1111/j.1470-6431.2005.00375.x
84. **UNESCO.** 2020. *Global Education Monitoring Report 2020: Inclusion and education: All means all.* Paris, UNESCO Publishing. https://doi.org/10.54676/JJNK6989
85. **Patton, G.C., Sawyer, S.M., Santelli, J.S., Ross, D.A., Afifi, R., Allen, N.B., Arora, M. *et al.*** 2016. Our future: a Lancet commission on adolescent health and wellbeing. *The Lancet*, 387(10036): 2423–2478. https://doi.org/10.1016/S0140-6736(16)00579-1
86. **D'Andrade, R.** 1991. The identification of schemas in naturalistic data. In: M.J. Horowitz, ed. *Person schemas and maladaptive interpersonal patterns*. John D. and Catherine T. MacArthur Foundation series on mental health and development. pp. 279–301. Chicago, IL, The University of Chicago Press.
87. **Rumelhart, D.E.** 1984. Schemata and the cognitive system. In: D.E. Carlston, ed. *Handbook of social cognition, Vol 1*. pp. 161–188. Mahwah, NJ, US, Lawrence Erlbaum Associates Publishers.
88. **Schank, R.C. & Abelson, R.P.** 1977. *Scripts, plans, goals, and understanding: An inquiry into human knowledge structures*. New York,USA, Psychology Press. https://doi.org/10.4324/9780203781036
89. **Blake, C. & Bisogni, C.A.** 2003. Personal and family food choice schemas of rural women in upstate New York. *Journal of Nutrition Education and Behavior*, 35(6):

282–293. https://doi.org/10.1016/S1499-4046(06)60342-4

90. **Blake, C.E., Bisogni, C.A., Sobal, J., Jastran, M. & Devine, C.M.** 2008. How adults construct evening meals. Scripts for food choice. *Appetite*, 51(3): 654–662. https://doi.org/10.1016/j.appet.2008.05.062
91. **Morrison, S.A., Dashiff, C.J. & Vance, D.E.** 2013. Role of parental autonomy support on self-determination in influencing diet and exercise motivation in older adolescents. *Nursing: Research and Reviews*, 3: 77–85. https://doi.org/10.2147/NRR.S43795
92. **Deslippe, A.L., O'Connor, T.M., Brussoni, M. & Mâsse, L.C.** 2022. The association of food parenting practices with adolescents' dietary behaviors differ by youth gender, but not by parent gender. *Appetite*, 169: 105846. https://doi.org/10.1016/j.appet.2021.105846
93. **Blake, C.E., Bell, B.A., Freedman, D.A., Colabianchi, N. & Liese, A.D.** 2013. The Eating Identity Type Inventory (EITI). Development and associations with diet. *Appetite*, 69: 15–22. https://doi.org/10.1016/j.appet.2013.05.008
94. **Bogueva, D. & Marinova, D.** 2022. Australian Generation Z and the nexus between climate change and alternative proteins. *Animals*, 12(19): 2512. https://doi.org/10.3390/ani12192512
95. **Ziegler, A.M., Kasprzak, C.M., Mansouri, T.H., Gregory, A.M., Barich, R.A., Hatzinger, L.A., Leone, L.A. & Temple, J.L.** 2021. An ecological perspective of food choice and eating autonomy among adolescents. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.654139
96. **Smetana, J.G., Campione-Barr, N. & Daddis, C.** 2004. Longitudinal development of family decision making: Defining healthy behavioral autonomy for middle-class African American adolescents. *Child Development*, 75(5): 1418–1434. https://doi.org/10.1111/j.1467-8624.2004.00749.x
97. **Bassett, R., Chapman, G.E. & Beagan, B.L.** 2008. Autonomy and control: The co-construction of adolescent food choice. *Appetite*, 50(2–3): 325–332. https://doi.org/10.1016/j.appet.2007.08.009
98. **Bissonnette, M.M. & Contento, I.R.** 2001. Adolescents' perspectives and food choice behaviors in terms of the environmental impacts of food production practices: Application of a psychosocial model. *Journal of Nutrition Education*, 33(2): 72–82. https://doi.org/10.1016/S1499-4046(06)60170-X
99. **Dang, H-M., Ho, H. & Weiss, B.** 2022. The "big four" health risk behaviors among Vietnamese adolescents: Co-occurrence and socio-cultural risk factors. *Health Psychology and Behavioral Medicine*, 10(1): 379–398. https://doi.org/10.1080/21642850.2022.2057314
100. **Farley, J.P. & Kim-Spoon, J.** 2014. The development of adolescent self-regulation: Reviewing the role of parent, peer, friend, and romantic relationships. *Journal of Adolescence*, 37(4): 433–440. https://doi.org/10.1016/j.adolescence.2014.03.009
101. **Banna, J.C., Buchthal, O.V., Delormier, T., Creed-Kanashiro, H.M. & Penny, M.E.** 2015. Influences on eating: A qualitative study of adolescents in a periurban area in Lima, Peru. *BMC Public Health*, 16(1): 40–40. https://doi.org/10.1186/s12889-016-2724-7
102. **Islam, M.R., Trenholm, J.E., Rahman, A., Pervin, J., Ekström, E-C. & Rahman, S.M.** 2019. Sociocultural influences on dietary practices and physical activity behaviors of rural adolescents: A qualitative exploration. *Nutrients*, 11(12): 2916. https://doi.org/10.3390/nu11122916
103. **De Vet, E., De Wit, J.B.F., Luszczynska, A., Stok, F.M., Gaspar, T., Pratt, M., Wardle, J. *et al.*** 2013. Access to excess: How do adolescents deal with unhealthy foods in their environment? *The European Journal of Public Health*, 23(5): 752–756. https://doi.org/10.1093/eurpub/cks185
104. **Isasi, C.R. & Wills, T.A.** 2011. Behavioral self-regulation and weight-related behaviors in inner-city adolescents: A model of direct and indirect effects. *Childhood Obesity*, 7(4): 306–315. https://doi.org/10.1089/chi.2011.0011
105. **Delormier, T., Frohlich, K.L. & Potvin, L.** 2009. Food and eating as social practice – understanding eating patterns as social phenomena and implications for public health. *Sociology of Health & Illness*, 31(2): 215–228. https://doi.org/10.1111/j.1467-9566.2008.01128.x
106. **Boncyk, M., Shemdoe, A., Ambikapathi, R., Mosha, D., Froese, S.L., Verissimo, C.K., Mwanyika-Sando, M. *et al.*** 2022. Exploring drivers of food choice among PLHIV and their families in a peri-urban Dar es Salaam, Tanzania. *BMC Public Health*, 22(1): 1068. https://doi.org/10.1186/s12889-022-13430-3
107. **Skoyen, J.A., Blank, E., Corkery, S.A. & Butler, E.A.** 2013. The interplay of partner influence and individual values predicts daily fluctuations in eating and physical activity. *Journal of Social and Personal Relationships*, 30(8): 1000–1019. https://doi.org/10.1177/0265407513479214
108. **The, N.S. & Gordon-Larsen, P.** 2009. Entry Into romantic partnership is associated with obesity. *Obesity*, 17(7): 1441–1447. https://doi.org/10.1038/oby.2009.97
109. **Dennis, M.R.** 2006. Compliance and intimacy: Young adults' attempts to motivate health-promoting behaviors by romantic partners. *Health Communication*, 19(3): 259–267. https://doi.org/10.1207/s15327027hc1903_8
110. **Hasford, J., Kidwell, B. & Lopez-Kidwell, V.** 2018. Happy wife, happy life: Food choices in romantic relationships. *Journal of Consumer Research*, 44(6): 1238–1256. https://doi.org/10.1093/jcr/ucx093
111. **Kibr, G.** 2021. A narrative review of nutritional malpractices, motivational drivers, and consequences in pregnant women: Evidence from recent literature and program implications in Ethiopia. *The Scientific World Journal*, 2021: 5580039. https://doi.org/10.1155/2021/5580039
112. **Chakona, G. & Shackleton, C.** 2019. Food taboos and cultural beliefs influence food choice and dietary preferences among pregnant women in the Eastern Cape, South Africa. *Nutrients*, 11(11): 2668. https://doi.org/10.3390/nu11112668
113. **Levey, E.J., Morfín Rodriguez, A.E., Chang, A.R., Rondon, M.B., Jimenez Sanchez, M.L., Harrison, A.M., Gelaye, B. *et al.*** 2024. A qualitative analysis of adolescent motherhood within the broader family context in Peru. *Family Relations*, 73(2): 1046–1066. https://doi.org/10.1111/fare.12904
114. **Boncyk, M., Ambikapathi, R., Mosha, D., Matangi, E., Galvin, L., Jeong, J., Sultan, R. *et al.*** 2019. Big sister, big brother: A mixed methods study on older siblings' role in infant and young child feeding and care in rural Tanzania (P10-020-19). *Current Developments in Nutrition*, 3: nzz034.P10-020-19. https://doi.org/10.1093/cdn/nzz034.P10-020-19
115. **Connors, M., Bisogni, C.A., Sobal, J. & Devine, C.M.** 2001. Managing values in personal food systems. *Appetite*, 36(3): 189–200. https://doi.org/10.1006/appe.2001.0400
116. **Wiig Dammann, K. & Smith, C.** 2009. Factors affecting low-income women's food choices and the perceived impact of dietary intake and socioeconomic status on their health and weight. *Journal of Nutrition Education and Behavior*, 41(4): 242–253. https://doi.org/10.1016/j.jneb.2008.07.003
117. **Inglis, V., Ball, K. & Crawford, D.** 2009. Does modifying the household food budget predict changes in the healthfulness of purchasing choices among low- and high-income women? *Appetite*, 52(2): 273–279. https://doi.org/10.1016/j.appet.2008.10.005
118. **Lawrence, W., Skinner, C., Haslam, C., Robinson, S., Inskip, H., Barker, D., Cooper, C. *et al.*** 2009. Why women of lower educational attainment struggle to make healthier food choices: The importance of psychological and social factors. *Psychology & Health*, 24(9): 1003–1020. https://doi.org/10.1080/08870440802460426
119. **Berti, P.R.** 2012. Intrahousehold distribution of food: A review of the literature and discussion of the implications for food fortification programs. *Food and Nutrition Bulletin*, 33(3_suppl2): S163–S169. https://doi.org/10.1177/15648265120333S204
120. **Harris-Fry, H., Shrestha, N., Costello, A. & Saville, N.M.** 2017. Determinants of intra-household food allocation between adults in South Asia – a systematic review. *International Journal for Equity in Health*, 16(1): 107. https://doi.org/10.1186/s12939-017-0603-1
121. **Boncyk, M., Blake, C.E., Lepine, A., Prieto-Merino, D., Bukachi, S.A., Ngutu, M., Kadiyala, S. *et al.*** 2024. Associations of intrahousehold allocation of animal source food with mother and child nutrition outcomes in low-income informal settlements of Nairobi, Kenya. *Current Developments in Nutrition*, 8(2): 103138. https://doi.org/10.1016/j.cdnut.2024.103138122. **Monge-Rojas, R., Fuster-Baraona, T., Garita, C., Sánchez, M.G., Smith-Castro, V., Valverde-Cerros, O. & Colón-Ramos, U.** 2015. The influence of gender stereotypes on eating habits among Costa Rican adolescents. *American Journal of Health Promotion*, 29(5): 303–310. https://doi.org/10.4278/ajhp.130904-qual-462
123. **Esnaola, I., Rodríguez, A. & Goñi, A.** 2010. Body dissatisfaction and perceived sociocultural pressures: Gender and age differences. *Salud Mental*, 33(1): 21–29.
124. **Helfert, S. & Warschburger, P.** 2013. The face of appearance-related social pressure: Gender, age and body mass variations in peer and parental pressure during adolescence. *Child and Adolescent Psychiatry and Mental Health*, 7(1): 16–16. https://doi.org/10.1186/1753-2000-7-16
125. **Meyer, T.A. & Gast, J.** 2008. The effects of peer influence on disordered eating behavior. *Journal of School Nursing*, 24(1): 36–42.

https://doi.org/10.1177/1059840508024001060l

126. **Gaspar De Matos, M., Palmeira, A.L., Gaspar, T., De Wit, J.B.F. & Luszczynska, A.** 2016. Social support influences on eating awareness in children and adolescents: The mediating effect of self-regulatory strategies. *Global Public Health*, 11(4): 437–448. https://doi.org/10.1080/17441692.2015.1094106
127. **Ganson, K.T., Testa, A., Rodgers, R.F., Murray, S.B. & Nagata, J.M.** 2025. Exploring body ideal internalization, sociocultural pressures, and probable muscle dysmorphia in Canadian and American boys and men. *Eating Behaviors*, 56: 101944. https://doi.org/10.1016/j.eatbeh.2025.101944
128. **Bava, S. & Tapert, S.F.** 2010. Adolescent brain development and the risk for alcohol and other drug problems. *Neuropsychology Review*, 20(4): 398–413. https://doi.org/10.1007/s11065-010-9146-6
129. **Steinberg, L.** 2004. Risk taking in adolescence: What changes, and why? *Annals of the New York Academy of Sciences*, 1021(1): 51–58. https://doi.org/10.1196/annals.1308.005
130. **Bowers, E.P., Gestsdottir, S., Geldhof, G.J., Nikitin, J., von Eye, A. & Lerner, R.M.** 2011. Developmental trajectories of intentional self regulation in adolescence: The role of parenting and implications for positive and problematic outcomes among diverse youth. *Journal of Adolescence*, 34(6): 1193–1206. https://doi.org/10.1016/j.adolescence.2011.07.006
131. **Fielding-Singh, P.** 2017. A taste of inequality: Food's symbolic value across the socioeconomic spectrum. *Sociological Science*, 4: 424–448. https://doi.org/10.15195/v4.a17
132. **Joshi, N. & Raghuvanshi, R.S.** 2021. Determinants of household food insecurity in rural areas of the hilly region of Kumaun, Uttarakhand, India: A pilot study. *Ecology of Food and Nutrition*, 60(3): 351–376. https://doi.org/10.1080/03670244.2020.1852228
133. **Bourdieu, P. & Bennett, T.** 2010. *Distinction: A social critique of the judgement of taste*. London & New York, Routledge.
134. **Blake, C.E., Monterrosa, E.C., Rampalli, K.K., Khan, A.N.S., Reyes, L.I., Drew, S.D., Dominguez-Salas, P. *et al.*** 2023. Basic human values drive food choice decision-making in different food environments of Kenya and Tanzania. *Appetite*, 188: 106620. https://doi.org/10.1016/j.appet.2023.106620
135. **Bargiota, A., Delizona, M., Pelekanou, M., Tsitouras, A. & Koukoulis, G.N.** 2013. Eating habits and factors affecting food choice of adolescents living in rural areas. *Hormones (Greece)*, 12(2): 246–253. https://doi.org/10.14310/horm.2002.1408
136. **Michikyan, M. & Suárez-Orozco, C.** 2016. Adolescent media and social media use implications for development. *Journal of Adolescent Research*, 31(4): 411–414. https://doi.org/10.1177/0743558416643801
137. **Chung, A., Vieira, D., Donley, T., Tan, N., Jean-Louis, G., Kiely Gouley, K. & Seixas, A.** 2021. Adolescent peer influence on eating behaviors via social media: Scoping review. *Journal of Medical Internet Research*, 23(6): e19697. https://doi.org/10.2196/19697
138. **Elliott, C.D. & Truman, E.** 2024. Food marketing on digital platforms: What do teens see? *Public Health Nutrition*, 27(1): e48. https://doi.org/10.1017/S1368980024000235
139. **Tsochantaridou, A., Sergentanis, T.N., Grammatikopoulou, M.G., Merakou, K., Vassilakou, T. & Kornarou, E.** 2023. Food advertisement and dietary choices in adolescents: An overview of recent studies. *Children*, 10(3): 442. https://doi.org/10.3390/children10030442
140. **Love, B., M. Thompson, C., Crook, B. & Donovan-Kicken, E.** 2013. Work and "mass personal" communication as means of navigating nutrition and exercise concerns in an online cancer community. *Journal of Medical Internet Research*, 15(5): e102. https://doi.org/10.2196/jmir.2594
141. **Friedman, V.J., Wright, C.J.C., Molenaar, A., McCaffrey, T., Brennan, L. & Lim, M.S.C.** 2022. The use of social media as a persuasive platform to facilitate nutrition and health behavior change in young adults: Web-based conversation study. *Journal of Medical Internet Research*, 24(5): e28063. https://doi.org/10.2196/28063
142. **Klassen, K.M., Douglass, C.H., Brennan, L., Truby, H. & Lim, M.S.C.** 2018. Social media use for nutrition outcomes in young adults: A mixed-methods systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 15(1): 70. https://doi.org/10.1186/s12966-018-0696-y
143. **Cairns, G.** 2013. Evolutions in food marketing, quantifying the impact, and policy implications. *Appetite*, 62: 194–197. https://doi.org/10.1016/j.appet.2012.07.016
144. **Sidani, J.E., Shensa, A., Hoffman, B., Hanmer, J. & Primack, B.A.** 2016. The association between social media use and eating concerns among US young adults. *Journal of the Academy of Nutrition and Dietetics*, 116(9): 1465–1472. https://doi.org/10.1016/j.jand.2016.03.021
145. **Nawaz, F.A., Riaz, M.M.A., Banday, N.U.A., Singh, A., Arshad, Z., Derby, H. & Sultan, M.A.** 2024. Social media use among adolescents with eating disorders: A double-edged sword. *Frontiers in Psychiatry*, 15: 1300182. https://doi.org/10.3389/fpsyt.2024.1300182146. **Fretes, G., Veliz, P., Narvaez, A.M., Williams, D., Sibille, R., Arts, M. & Leroy, J.L.** 2025. Digital marketing of unhealthy foods and non-alcoholic beverages to children and adolescents: A narrative review. *Current Developments in Nutrition*, 9(2): 104545. https://doi.org/10.1016/j.cdnut.2025.104545
147. **Freeman, B., Kelly, B., Vandevijvere, S. & Baur, L.** 2015. Young adults: Beloved by food and drink marketers and forgotten by public health? *Health Promotion International*, 31(4): 954–961. https://doi.org/10.1093/heapro/dav081
148. **Harris, J.L., Brownell, K.D. & Bargh, J.A.** 2009. The food marketing defense model: Integrating psychological research to protect youth and inform public policy. *Social Issues and Policy Review*, 3(1): 211–271. https://doi.org/10.1111/j.1751-2409.2009.01015.x
149. **Grier, S.A. & Kumanyika, S.** 2010. Targeted marketing and public health. *Annual Review of Public Health*, 31(1): 349–369. https://doi.org/10.1146/annurev.publhealth.012809.103607
150. **Lattimore, P. & Mead, B.R.** 2015. See it, grab it, or STOP! Relationships between trait impulsivity, attentional bias for pictorial food cues and associated response inhibition following in-vivo food cue exposure. *Appetite*, 90: 248–253. https://doi.org/10.1016/j.appet.2015.02.020
151. **Poobalan, A.S., Aucott, L.S., Clarke, A. & Smith, W.C.S.** 2014. Diet behaviour among young people in transition to adulthood (18–25 year olds): A mixed method study. *Health Psychology and Behavioral Medicine*, 2(1): 909–928. https://doi.org/10.1080/21642850.2014.931232
152. **Patil, A. & Singh, N.** 2023. From the plate to the mind: How children's eating habits affect their physical and mental health. *Journal of Neurological, Psychiatric and Mental Health Nursing*, 5(2): 40–53. https://doi.org/10.46610/jnpmhn.2023.v05i02.005
153. **van der Horst, K., Oenema, A., Ferreira, I., Wendel-Vos, W., Giskes, K., van Lenthe, F.J. & Brug, J.** 2006. A systematic review of environmental correlates of obesity-related dietary behaviors in youth. *Health Education Research*, 22(2): 203–226. https://doi.org/10.1093/her/cyl069
154. **Sacks, G. & Looi, E.S.Y.** 2020. The advertising policies of major social media platforms overlook the imperative to restrict the exposure of children and adolescents to the promotion of unhealthy foods and beverages. *International Journal of Environmental Research and Public Health*, 17(11): 4172. https://doi.org/10.3390/ijerph17114172
155. **Fretes, G., Corvalán, C., Reyes, M., Taillie, L.S., Economos, C.D., Wilson, N.L.W. & Cash, S.B.** 2023. Changes in children's and adolescents' dietary intake after the implementation of Chile's law of food labeling, advertising and sales in schools: A longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity*, 20(1): 40. https://doi.org/10.1186/s12966-023-01445-x
156. **Carpentier, F.R.D., Correa, T., Reyes, M. & Taillie, L.S.** 2020. Evaluating the impact of Chile's marketing regulation of unhealthy foods and beverages: Pre-school and adolescent children's changes in exposure to food advertising on television. *Public Health Nutrition*, 23(4): 747–755. https://doi.org/10.1017/S1368980019003355
157. **El-Far, D.** 2023. The impact of nutrition on the mental and physical health of young adults. *WRIT: Journal of First-Year Writing*, 5(1). https://doi.org/10.25035/writ.05.01.01
158. **Koehn, S., Gillison, F., Standage, M. & Bailey, J.** 2016. Life transitions and relevance of healthy living in late adolescence. *Journal of Health Psychology*, 21(6): 1085–1095. https://doi.org/10.1177/1359105314546340
159. **Crookston, B.T., Forste, R., McClellan, C.L., Georgiadis, A. & Heaton, T.B.** 2014. Factors associated with cognitive achievement in late childhood and adolescence: The Young Lives cohort study of children in Ethiopia, India, Peru, and Vietnam. *BMC Pediatrics*, 14(1): 253–253. https://doi.org/10.1186/1471-2431-14-253

160. **Schoeni, R.F. & Ross, K.E.** 2004. Family support during the transition to adulthood. *Policy Brief*, 3 August 2004. Ann Arbor, MI, National Poverty Center. https://files.eric.ed.gov/fulltext/ED520735.pdf
161. **Amarnani, E.D., Nandi, A. & Melgar-Quiñonez, H.** 2018. Food Insecurity in the global youth: An analysis of income-related inequalities. *The FASEB Journal*, 31(S1). https://doi.org/10.1096/fasebj.31.1_supplement.312.5
162. **Strauss, J. & Thomas, D.** 1998. Health nutrition and economic development. *Journal of Economic Literature*, 36(2): 766–817.
163. **Masters, M.A., Krogstrand, K.S., Eskridge, K.M. & Albrecht, J.A.** 2014. Race/ethnicity and income in relation to the home food environment in US youth aged 6 to 19 years. *Journal of the Academy of Nutrition and Dietetics*, 114(10): 1533–1543. https://doi.org/10.1016/j.jand.2014.04.023
164. **Banerji, A., Pelletier, V.A., Haring, R., Irvine, J., Bresnahan, A. & Lavallee, B.** 2023. Food insecurity and its consequences in indigenous children and youth in Canada. *PLOS Global Public Health*, 3(9): e0002406. https://doi.org/10.1371/journal.pgph.0002406
165. **OECD.** 2020. *Linking indigenous communities with regional development in Canada*. OECD Rural Policy Reviews. Paris, OECD Publishing. https://doi.org/10.1787/fa0f60c6-en
166. **OACAS (Ontario Association of Children's Aid Societies)**. undated. Poverty and child welfare: Poverty in Indigenous and racialized communities. *OACAS*. Toronto, ON. [Cited 14 January 2025]. https://oacas.libguides.com/c.php?g=702168&p=4993507
167. **Ambikapathi, R., Schneider, K.R., Davis, B., Herrero, M., Winters, P. & Fanzo, J.C.** 2022. Global food systems transitions have enabled affordable diets but had less favourable outcomes for nutrition, environmental health, inclusion and equity. *Nature Food*, 3(9): 764–779. https://doi.org/10.1038/s43016-022-00588-7
168. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512
169. **FAO**. 2024. *The State of Food and Agriculture 2024*. Rome. https://doi.org/10.4060/cd2616en
170. **HLPE (High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security)**. 2020. *Food security and nutrition: Building a global narrative towards 2030*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/8357b6eb-8010-4254-814a-1493faaf4a93/content
171. **Ferdinand, K.C., Indrajeet Mahata & Mahata, I.** 2017. Food deserts: Limited healthy foods in the land of plenty. *Circulation-cardiovascular Quality and Outcomes*, 10(9). https://doi.org/10.1161/circoutcomes.117.004131
172. **Thomsen, M.R., Nayga, R.M., Alviola, P.A. & Rouse, H.L.** 2016. The effect of food deserts on the body mass index of elementary schoolchildren. *American Journal of Agricultural Economics*, 98(1): 1–18. https://doi.org/10.1093/ajae/aav039
173. **Smith, L.C. & Haddad, L.** 2015. Reducing child undernutrition: Past drivers and priorities for the post-MDG era. *World Development*, 68: 180–204. https://doi.org/10.1016/j.worlddev.2014.11.014
174. **Popkin, B.M.** 2017. Relationship between shifts in food system dynamics and acceleration of the global nutrition transition. *Nutrition Reviews*, 75(2): 73–82. https://doi.org/10.1093/nutrit/nuw064
175. **Development Initiatives**. 2021. *2021 Global Nutrition Report: The state of global nutrition*. Bristol, UK. Initiatives. https://media.globalnutritionreport.org/documents/2021_Global_Nutrition_Report_aUfTRv0.pdf
176. **Kadiyala, S.** 2019. *Rural transformation and the double burden of malnutrition among rural youth in developing countries*. IFAD research series 50. Rome, International Fund for Agricultural Development.
177. **Pinard, C.A., Shanks, C.B., Harden, S.M. & Yaroch, A.L.** 2016. An integrative literature review of small food store research across urban and rural communities in the U.S. *Preventive Medicine Reports*, 3: 324–332. https://doi.org/10.1016/j.pmedr.2016.03.008
178. **Paul, D., Chakraborti, C. & Mishra, P.** 2023. Factors affecting malnutrition of rural adolescent girls: Evidences from selected districts of West Bengal. *Children and youth services review*, 152: 107065–107065. https://doi.org/10.1016/j.childyouth.2023.107065
179. **Uthman, O.A. & Aremu, O.** 2008. Malnutrition among women in sub-Saharan Africa: Rural-urban disparity. *Rural and Remote Health*, 8(2): 931–931. https://doi.org/10.22605/rrh931
180. **Losada-Rojas, L.L., Ke, Y., Pyrialakou, V.D. & Gkritza, K.** 2021. Access to healthy food in urban and rural areas: An empirical analysis. *Journal of Transport and Health*, 23: 101245. https://doi.org/10.1016/j.jth.2021.101245
181. **Jones, N., Pincock, K., Baird, S., Yadete, W. & Hamory Hicks, J.** 2020. Intersecting inequalities, gender and adolescent health in Ethiopia. *International Journal for Equity in Health*, 19: 97. https://doi.org/10.1186/s12939-020-01214-3

CHAPTER 6

1. **Barrett, C.B., Ghezzi-Kopel, K., Hoddinott, J., Homami, N., Tennant, E., Upton, J. & Wu, T.** 2021. A scoping review of the development resilience literature: Theory, methods and evidence. *World Development*, 146: 105612. https://doi.org/10.1016/j.worlddev.2021.105612
2. **Béné, C., Frankenberger, T.R., Nelson, S., Constas, M.A., Collins, G., Langworthy, M. & Fox, K.** 2023. Food system resilience measurement: Principles, framework and caveats. *Food Security*, 15(6): 1437–1458. https://doi.org/10.1007/s12571-023-01407-y
3. **Béné, C. & Haque, M.A.B.M.** 2022. Strengthening the resilience of vulnerable communities: Results from a quasi-experimental impact evaluation in coastal Bangladesh. *The European Journal of Development Research*, 34(2): 843–868. https://doi.org/10.1057/s41287-021-00399-9
4. **Jones, L. & d'Errico, M.** 2019. Whose resilience matters? Like-for-like comparison of objective and subjective evaluations of resilience. *World Development*, 124: 104632. https://doi.org/10.1016/j.worlddev.2019.104632
5. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport
6. **Ullah, A., Adams, F. & Bavorova, M.** 2024. Empowering young farmers' voices in climate change extension programs: An in-depth analysis of decision-making dynamics and social media engagement. *International Journal of Disaster Risk Reduction*, 111: 104713.
7. **Yeung, W-J.J. & Yang, Y.** 2020. Labor market uncertainties for youth and young adults: An international perspective. *The ANNALS of the American Academy of Political and Social Science*, 688(1): 7–19. https://doi.org/10.1177/0002716220913487
8. **Bell, D.N.F. & Blanchflower, D.G.** 2011. Young people and the Great Recession. *Oxford Review of Economic Policy*, 27(2): 241–267. https://doi.org/10.1093/oxrep/grr011
9. **ILO**. 2022. *Global Employment Trends for Youth 2022: Investing in transforming futures for young people.* Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40dcomm/%40publ/documents/publication/wcms_853321.pdf
10. **Mills, M., Blossfeld, H-P. & Klijzing, E.** 2005. Becoming an adult in uncertain times: A 14-country comparison of the losers of globalization. In: H.P. Blossfeld, E. Klijzing, M. Mills & K. Kurz, eds. *Globalization, uncertainty and youth in society*. Chapter 17. Abingdon-on Thames, UK, Routledge.
11. **Kalleberg, A.L.** 2018. Job insecurity and well-being in rich democracies. *The Economic and Social Review*, 49(3, Autumn): 241–258.
12. **ILO**. 2016. *World Employment Social Outlook 2016: Trends for youth*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40dgreports/%40dcomm/%40publ/documents/publication/wcms_443480.pdf
13. **ILO**. 2024. *Global Employment Trends for Youth 2024: Decent work, brighter futures*. Geneva. www.ilo.org/sites/default/files/2024-11/GET_2024_EN_web4.pdf
14. **Belfield, C.R., Levin, H.M. & Rosen, R.** 2012. *The economic value of opportunity youth*. Washington, DC. Corporation for National and Community Service.

https://files.eric.ed.gov/fulltext/ED528650.pdf

15. **Banati, P., Jones, N. & Youssef, S.** 2020. Intersecting vulnerabilities: The impacts of COVID-19 on the Psycho-emotional lives of young people in low- and middle-income countries. *The European Journal of Development Research*, 32(5): 1613–1638. https://doi.org/10.1057/s41287-020-00325-5
16. **Kugler, M., Viollaz, M., Duque, D., Gaddis, I., Newhouse, D., Palacios-Lopez, A. & Weber, M.** 2023. How did the COVID-19 crisis affect different types of workers in the developing world? *World Development*: 106331. https://doi.org/10.1016/j.worlddev.2023.106331
17. **Xenos, P., Achmad, S., Sheng Lin, H., Keung Luis, P., Podhisita, C., Raymundo, C. & Thapa, S.** 2006. Delayed Asian transitions to adulthood: A perspective from national youth surveys. *Asian Population Studies*, 2(2): 149–185. https://doi.org/10.1080/17441730600923117
18. **Yeung, W-J.J. & Alipio, C.** 2013. Transitioning to adulthood in Asia: School, work, and family life. *The ANNALS of the American Academy of Political and Social Science*, 646(1): 6–27. https://doi.org/10.1177/0002716212470794
19. **Antoniou, K.M., Vasarmidi, E., Russell, A-M., Andrejak, C., Crestani, B., Delcroix, M., Dinh-Xuan, A.T. *et al.*** 2022. European Respiratory Society statement on long COVID follow-up. *European Respiratory Journal*, 60(2). https://doi.org/10.1183/13993003.02174-2021
20. **Furstenberg, F.F.** 2010. On a new schedule: Transitions to adulthood and family change. *The Future of Children*, 20(1): 67–87.
21. **Thomas, D., Beegle, K. & Frankenberg, E.** 2000. *Labor market transitions of men and women during an economic crisis: Evidence from Indonesia*. Labor and Population Program Working Paper Series 00–11. Santa Monica, CA, RAND. www.rand.org/content/dam/rand/pubs/drafts/2008/DRU2344.pdf
22. **Potts, D.** 2005. Counter-urbanisation on the Zambian Copperbelt? Interpretations and Implications. *Urban Studies*, 42(4): 583–609. https://doi.org/10.1080/00420980500060137
23. **Margulis, M. & Claeys, P.** 2015. *Peasants, smallholders and post-global food crisis agriculture investment programs*. HAL Open Science. halshs-01316870. https://shs.hal.science/halshs-01316870v1/file/FMSH-WP-2016-110%20Claes.pdf
24. **Headey, D. & Fan, S.** 2008. Anatomy of a crisis: the causes and consequences of surging food prices. *Agricultural Economics*, 39(s1): 375–391. https://doi.org/10.1111/j.1574-0862.2008.00345.x
25. **Sdrolias, L., Semos, A., Mattas, K., Tsakiridou, E., Michailides, A., Partalidou, M. & Tsiotas, D.** 2022. Assessing the agricultural sector's resilience to the 2008 economic crisis: The case of Greece. *Agriculture*, 12(2): 174. https://doi.org/10.3390/agriculture12020174
26. **Béné, C., Bakker, D., Chavarro, M.J., Even, B., Melo, J. & Sonneveld, A.** 2021. Global assessment of the impacts of COVID-19 on food security. *Global Food Security*, 31: 100575. https://doi.org/10.1016/j.gfs.2021.100575
27. **Bochtis, D., Benos, L., Lampridi, M., Marinoudi, V., Pearson, S. & Sørensen, C.G.** 2020. Agricultural workforce crisis in light of the COVID-19 pandemic. *Sustainability*, 12(19): 8212. https://doi.org/10.3390/su12198212
28. **Davis, B., Mane, E., Gurbuzer, L.Y., Caivano, G., Piedrahita, N., Schneider, K., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series No. 23–34. Rome, FAO. www.fao.org/documents/card/en/c/cc4337en
29. **FAO**. 2023. *The status of women in agrifood systems*. Rome. https://doi.org/10.4060/cc5343en
30. **Fana, M., Torrejón Pérez, S. & Fernández-Macías, E.** 2020. Employment impact of Covid-19 crisis: From short term effects to long terms prospects. *Journal of Industrial and Business Economics*, 47(3): 391–410. https://doi.org/10.1007/s40812-020-00168-5
31. **Egger, D., Miguel, E., Warren, S.S., Shenoy, A., Collins, E., Karlan, D., Parkerson, D. *et al.*** 2021. Falling living standards during the COVID-19 crisis: Quantitative evidence from nine developing countries. *Science Advances*, 7(6): eabe0997. https://doi.org/10.1126/sciadv.abe0997
32. **Hamid, S. & Mir, M.Y.** 2021. Global agri-food sector: Challenges and opportunities in COVID-19 pandemic. *Frontiers in Sociology*, 6. https://doi.org/10.3389/fsoc.2021.647337
33. **Flor, L.S., Friedman, J., Spencer, C.N., Cagney, J., Arrieta, A., Herbert, M.E., Stein, C. *et al.*** 2022. Quantifying the effects of the COVID-19 pandemic on gender equality on health, social, and economic indicators: A comprehensive review of data from March, 2020, to September, 2021. *The Lancet*, 399(10344): 2381–2397. https://doi.org/10.1016/S0140-6736(22)00008-3
34. **Bezner Kerr, R., Hasegawa, T., Lasco, R., Bhatt, I., Deryng, D., Farrell, A., Gurney-Smith, H. *et al.*** 2023. Food, fibre, and other ecosystem products. In: H-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig *et al.*, eds. *Climate Change 2022 – Impacts, adaptation and vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. First edition, pp. 713–906. Cambridge, UK and New York, USA, Cambridge University Press. https://doi.org/10.1017/9781009325844
35. **Cattaneo, C. & Peri, G.** 2016. The migration response to increasing temperatures. *Journal of Development Economics*, 122: 127–146. https://doi.org/10.1016/j.jdeveco.2016.05.004
36. **Connolly-Boutin, L. & Smit, B.** 2016. Climate change, food security, and livelihoods in sub-Saharan Africa. *Regional Environmental Change*, 16(2): 385–399. https://doi.org/10.1007/s10113-015-0761-x
37. **FAO**. 2024. *The unjust climate: Measuring the impacts of climate change on rural poor, women and youth*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/62b46527-6ddc-4b8b-9078-bc32c14978f5/content
38. **Kogo, B.K., Kumar, L., Koech, R. & Hasan, M.K.** 2022. Response to climate change in a rain-fed crop production system: Insights from maize farmers of western Kenya. *Mitigation and Adaptation Strategies for Global Change*, 27(8): 50. https://doi.org/10.1007/s11027-022-10023-8
39. **Keshavarz, M. & Moqadas, R.S.** 2021. Assessing rural households' resilience and adaptation strategies to climate variability and change. *Journal of Arid Environments*, 184: 104323. https://doi.org/10.1016/j.jaridenv.2020.104323
40. **Bryan, E., Alvi, M., Huyer, S. & Ringler, C.** 2023. Addressing gender inequalities and strengthening women's agency for climate-resilient and sustainable food systems. CGIAR GENDER Impact Platform Working Paper No. 013. Nairobi, CGIAR GENDER Impact Platform. https://hdl.handle.net/10568/129709
41. **Deere, C.D. & Doss, C.R.** 2006. The gender asset gap: What do we know and why does it matter? *Feminist Economics*, 12(1–2): 1–50. https://doi.org/10.1080/13545700500508056
42. **Eastin, J.** 2018. Climate change and gender equality in developing states. *World Development*, 107: 289–305. https://doi.org/10.1016/j.worlddev.2018.02.021
43. **Elias, M., Zaremba, H., Tavenner, K., Ragasa, C., Paez Valencia, A.M., Choudhury, A. & de Haan, N.** 2024. Towards gender equality in forestry, livestock, fisheries and aquaculture. *Global Food Security*, 41: 100761. https://doi.org/10.1016/j.gfs.2024.100761
44. **Chakravarty, S., Das, S. & Vaillant, J.** 2017. *Gender and youth employment in sub-Saharan Africa: A review of constraints and effective interventions*. Policy Research working paper WPS 8245. Washington, DC, World Bank. https://doi.org/10.1596/1813-9450-8245
45. **ILO**. 2024. *Heat at work: Implications for safety and health: A global review of the science, policy and practice*. Geneva. www.ilo.org/sites/default/files/2024-07/ILO_OSH_Heatstress-R16.pdf
46. **Park, R.J., Behrer, A.P. & Goodman, J.** 2021. Learning is inhibited by heat exposure, both internationally and within the United States. *Nature Human Behaviour*, 5(1): 19–27. https://doi.org/10.1038/s41562-020-00959-9
47. **Venegas Marin, S., Schwarz, L. & Sabarwal, S.** 2024. Impacts of extreme weather events on education outcomes: A review of evidence. *The World Bank Research Observer*, 39(2): 177–226. https://doi.org/10.1093/wbro/lkae001
48. **Vu, T.M.** 2022. Effects of heat on mathematics test performance in Vietnam. *Asian Economic Journal*, 36(1): 72–94. https://doi.org/10.1111/asej.12259
49. **Valencia Amaya, M.G.** 2020. Climate shocks and human capital: The impact of the natural disasters of 2010 in Colombia on student achievement. *Cuadernos de Economía*, 39(79): 303–328. https://doi.org/10.15446/cuad.econ.v39n79.56830
50. **Thamtanajit, K.** 2020. The impacts of natural disaster on student achievement: Evidence from severe floods in Thailand. *The Journal of Developing Areas*, 54(4): 129–143.

51. **Marchetta, F., Sahn, D.E. & Tiberti, L.** 2019. The role of weather on schooling and work of young adults in Madagascar. *American Journal of Agricultural Economics*, 101(4): 1203–1227. https://doi.org/10.1093/ajae/aaz015
52. **de Janvry, A., Finan, F., Sadoulet, E. & Vakis, R.** 2006. Can conditional cash transfer programs serve as safety nets in keeping children at school and from working when exposed to shocks? *Journal of Development Economics*, 79(2): 349–373. https://doi.org/10.1016/j.jdeveco.2006.01.013
53. **Dasgupta, A. & Karandikar, A.** 2021. Gender-gap in learning outcomes under rainfall shocks: The role of gender norms. *Asoka University Economics Discussion Paper 70*, Sonipat, India, Ashoka University, Department of Economics. https://dp.ashoka.edu.in/ash/wpaper/paper70_0.pdf
54. **Andriano, L. & Behrman, J.** 2020. The effects of growing-season drought on young women's life course transitions in a sub-Saharan context. *Population Studies*, 74(3): 331–350. https://doi.org/10.1080/00324728.2020.1819551
55. **Corno, L., Hildebrandt, N. & Voena, A.** 2020. Age of marriage, weather shocks, and the direction of marriage payments. *Econometrica*, 88(3): 879–915. https://doi.org/10.3982/ECTA15505
56. **Corno, L. & Voena, A.** 2016. *Selling daughters: Age of marriage, income shocks and the bride price tradition*. Working Paper. W16/08. IFS Working Papers. https://doi.org/10.1920/wp.ifs.2016.1608
57. **Jensen, R. & Thornton, R.** 2003. Early female marriage in the developing world. *Gender & Development*, 11(2): 9–19. https://doi.org/10.1080/741954311
58. **Shayegh, S. & Dasgupta, S.** 2024. Climate change, labour availability and the future of gender inequality in South Africa. *Climate and Development*, 16(3): 209–226. https://doi.org/10.1080/17565529.2022.2074349
59. **Foster, J., Hodder, S.G., Lloyd, A.B. & Havenith, G.** 2020. Individual responses to heat stress: implications for hyperthermia and physical work capacity. *Frontiers in Physiology*, 11. https://doi.org/10.3389/fphys.2020.541483
60. **Helldén, D., Andersson, C., Nilsson, M., Ebi, K.L., Friberg, P. & Alfvén, T.** 2021. Climate change and child health: A scoping review and an expanded conceptual framework. *The Lancet Planetary Health*, 5(3): e164–e175. https://doi.org/10.1016/S2542-5196(20)30274-6
61. **Larose, J., Boulay, P., Sigal, R.J., Wright, H.E. & Kenny, G.P.** 2013. Age-related decrements in heat dissipation during physical activity occur as early as the age of 40. *PLOS ONE*, 8(12): e83148. https://doi.org/10.1371/journal.pone.0083148
62. **Agamile, P. & Lawson, D.** 2021. Rainfall shocks and children's school attendance: Evidence from Uganda. *Oxford Development Studies*, 49(3): 291–309. https://doi.org/10.1080/13600818.2021.1895979
63. **Acevedo, M.** 2016. *The effect of extreme hydro-meteorological events on labor market outcomes: Evidence from the Colombian Caribbean*. Unpublished paper. Washington, DC, World Bank. https://scholar.harvard.edu/files/maria_acevedo/files/labormarkets10dec2015.pdf
64. **Baez, J.E., Lucchetti, L., Genoni, M.E. & Salazar, M.** 2017. Gone with the storm: Rainfall shocks and household wellbeing in Guatemala. *The Journal of Development Studies*, 53(8): 1253–1271. https://doi.org/10.1080/00220388.2016.1224853
65. **Shah, M. & Steinberg, B.M.** 2017. Drought of opportunities: Contemporaneous and long-term impacts of rainfall shocks on human capital. *Journal of Political Economy*, 125(2): 527–561.
66. **World Bank Data**. 2022. Female labor force participation. In: *World Bank Gender Data Portal*. Washington, DC. [Cited 24 October 2024]. https://genderdata.worldbank.org/en/data-stories/flfp-data-story
67. **Nico, G. & Azzarri, C.** 2024. Climate change and sex-specific labor intensity: An empirical analysis in Africa. *Global Food Security*, 42: 100799. https://doi.org/10.1016/j.gfs.2024.100799
68. **Afridi, F., Mahajan, K. & Sangwan, N.** 2022. The gendered effects of droughts: Production shocks and labor response in agriculture. *Labour Economics*, 78: 102227. https://doi.org/10.1016/j.labeco.2022.102227
69. **Moshoeshoe, R., Nchake, M.A. & Tiberti, L.** 2021. *The effect of weather shocks on women's labor supply and the income of women-headed households in Lesotho*. Partnership for Economic Policy Working Paper 2021–15. https://conference.iza.org/conference_files/ClimateChange_2021/nchake_m31284.pdf
70. **Goldstone, J.A.** 2002. Population and security: How demographic change can lead to violent conflict. *Journal of International Affairs*, 56(1): 3–21.
71. **LaGraffe, D.** 2012. The youth bulge in Egypt: An Intersection of demographics, security, and the Arab Spring. *Journal of Strategic Security*, 5(2): 65–80.
72. **Urdal, H.** 2006. A clash of generations? Youth bulges and political violence. *International Studies Quarterly*, 50(3): 607–629. https://doi.org/10.1111/j.1468-2478.2006.00416.x
73. **Baliki, G., Brück, T., Ferguson, N.T.N. & Stojetz, W.** 2019. *Rural youth in the context of fragility and conflict*. IFAD Research Series. Rome, IFAD.
74. **Bricker, N.Q. & Foley, M.C.** 2013. The effect of youth demographics on violence: The importance of the labor market. *International Journal of Conflict and Violence (IJCV)*, 7(1): 179–194. https://doi.org/10.4119/ijcv-2974
75. **Lund, T., Andersen, J.H., Winding, T.N., Biering, K. & Labriola, M.** 2013. Negative life events in childhood as risk indicators of labour market participation in young adulthood: A prospective birth cohort study. *PLOS ONE*, 8(9): e75860. https://doi.org/10.1371/journal.pone.0075860
76. **Ali, R., Barra, A.F., Berg, C.N., Damania, R., Nash, J.D. & Russ, J.** 2015. *infrastructure in conflict-prone and fragile environments: Evidence from the Democratic Republic of Congo*. SSRN Scholarly Paper. 2607773. Rochester, NY, Social Science Research Network. https://papers.ssrn.com/abstract=2607773
77. **Blattman, C., Fiala, N. & Martinez, S.** 2014. Generating skilled self-employment in developing countries: Experimental evidence from Uganda. *The Quarterly Journal of Economics*, 129(2): 697–752. https://doi.org/10.1093/qje/qjt057
78. **Brück, T. & De Groot, O.J.** 2013. The economic impact of violent conflict. *Defence and Peace Economics*, 24(6): 497–501. https://doi.org/10.1080/10242694.2012.723153
79. **El-Bushra, J.** 2003. Fused in combat: Gender relations and armed conflict. *Development in Practice*, 13(2–3): 252–265. https://doi.org/10.1080/09614520302941
80. **Reynolds, A.N.** 2021. Women at work and war: Integrating gender and conflict into impact assessment. *Impact Assessment and Project Appraisal*, 39(3): 196–205. https://doi.org/10.1080/14615517.2021.1904375
81. **Kastrup, M.C.** 2006. Mental health consequences of war: Gender specific issues. *World Psychiatry*, 5(1): 33–34.
82. **Tewabe, D.S., Azage, M., Wubetu, G.Y., Fenta, S.A., Worke, M.D., Asres, A.M., Getnet, W.A. *et al.*** 2024. Gender-based violence in the context of armed conflict in Northern Ethiopia. *Conflict and Health*, 18(1): 1. https://doi.org/10.1186/s13031-023-00563-4
83. **Tol, W.A., Stavrou, V., Greene, M.C., Mergenthaler, C., van Ommeren, M. & García Moreno, C.** 2013. Sexual and gender-based violence in areas of armed conflict: A systematic review of mental health and psychosocial support interventions. *Conflict and Health*, 7(1): 16. https://doi.org/10.1186/1752-1505-7-16
84. **Bräuchler, B. & Ménard, A.** 2021. Patterns of im/mobility, conflict and the re/making of identity narratives. In: B. Bräuchler, ed. *Patterns of Im/mobility, Conflict and Identity*. Chapter 6. Abingdon-on-Thames, UK, Routledge. https://doi.org/10.1080/13504630.2017.1281418
85. **Ma, A. & Kusakabe, K.** 2015. Gender analysis of fear and mobility in the context of ethnic conflict in Kayah State, Myanmar. *Singapore Journal of Tropical Geography*, 36(3): 342–356. https://doi.org/10.1111/sjtg.12119
86. **Mazurana, D., Marshak, A. & Spears, K.** 2019. Child marriage in armed conflict. *International Review of the Red Cross*, 101(911): 575–601. https://doi.org/10.1017/S1816383120000156
87. **Buvinić, M., Das Gupta, M. & Shemyakina, O.N.** 2014. Armed conflict, gender, and schooling. *The World Bank Economic Review*, 28(2): 311–319. https://doi.org/10.1093/wber/lht032
88. **de Soysa, I. & Gleditsch, N.P.** 1999. *To cultivate peace: Agriculture in a world of conflict*. Environmental Change and Security Program. ww.wilsoncenter.org/sites/default/files/media/documents/publication/feature2.pdf
89. **Wischnath, G. & Buhaug, H.** 2014. Rice or riots: On food production and conflict severity across India. *Political Geography*, 43: 6–15. https://doi.org/10.1016/j.polgeo.2014.07.004

90. **Adelaja, A. & George, J.** 2019. Effects of conflict on agriculture: Evidence from the Boko Haram insurgency. *World Development*, 117: 184–195. https://doi.org/10.1016/j.worlddev.2019.01.010
91. **Iglesias Pinedo, W., Fulginiti, L.E. & Perrin, R.K.** 2024. The cost of armed conflict to agriculture in Colombia. *Research on World Agricultural Economy*, 5(3): 85–103. https://doi.org/10.36956/rwae.v5i3.1136
92. **McDougal, T. & Caruso, R.** 2016. Is there a relationship between wartime violence and postwar agricultural development outcomes? The case of concessions and community grants in Mozambique. *Political Geography*, 50: 20–32. https://doi.org/10.1016/j.polgeo.2015.09.001
93. **Holleman, C., Jackson, J., Sánchez, M.V. & Vos, R., eds.** 2017. *Sowing the seeds of peace for food security. Disentangling the nexus between conflict, food security and peace*. FAO Agricultural Development Economics Technical Study 2. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/9778a901-f5b9-4472-9812-9345faddd930/content
94. **Magdoff, F. & Tokar, B.** 2010. *Agriculture and food in crisis: Conflict, resistance, and renewal*. New York, USA, NYU Press.
95. **Cox, R.S. & Perry, K-M.E.** 2011. Like a fish out of water: Reconsidering disaster recovery and the role of place and social capital in community disaster resilience. *American Journal of Community Psychology*, 48(3): 395–411. https://doi.org/10.1007/s10464-011-9427-0
96. **Adger, W.N.** 2000. Social and ecological resilience: Are they related? *Progress in Human Geography*, 24(3): 347–364. https://doi.org/10.1191/030913200701540465
97. **Coscioni, V., de Oliveira, B.C., Marques, G. & da Silva, J.M.T.** 2023. Aspirations and expectations measures for adolescents and emerging adults: A scoping review. *Current Psychology*, 42(28): 24582–24598. https://doi.org/10.1007/s12144-022-03576-z
98. **Gates, S., Hegre, H., Nygård, H.M. & Strand, H.** 2012. Development consequences of armed conflict. *World Development*, 40(9): 1713–1722. https://doi.org/10.1016/j.worlddev.2012.04.031
99. **Vesco, P., Baliki, G., Brück, T., Döring, S., Eriksson, A., Fjelde, H., Guha-Sapir, D. *et al.*** 2025. The impacts of armed conflict on human development: A review of the literature. *World Development*, 187: 106806. https://doi.org/10.1016/j.worlddev.2024.106806
100. **Camacho, A. & Rodriguez, C.** 2013. Firm exit and armed conflict in Colombia. *Journal of Conflict Resolution*, 57(1): 89–116. https://doi.org/10.1177/0022002712464848
101. **Petracco, C. & Schweiger, H.** 2012. *The impact of armed conflict on firms' performance and perceptions*. SSRN Scholarly Paper. 2189409. Rochester, NY, Social Science Research Network. http://dx.doi.org/10.2139/ssrn.2189409
102. **Naudé, W., Amorós, J.E. & Brück, T.** 2024. State-based armed conflict and entrepreneurship: Empirical evidence. In: W. Naudé & B. Power, eds. *Handbook of Research on Entrepreneurship and Conflict.* Chapter 7. Cheltenham, Uk, Edward Elgar Publishing. www.elgaronline.com/edcollchap/book/9781802206791/book-part-9781802206791-16.xml
103. **Van Leeuwen, M. & Van Der Haar, G.** 2016. Theorizing the land–violent conflict nexus. *World Development*, 78: 94–104. https://doi.org/10.1016/j.worlddev.2015.10.011
104. **Kafando, W.A. & Sakurai, T.** 2004. Effects and mechanisms of armed conflict on agricultural production: Spatial evidence from terrorist violence in Burkina Faso. *Journal of Agricultural Economics*, 76(1): 24–44. https://doi.org/10.1111/1477-9552.12613
105. **Ronzani, P., Stojetz, W., Azzarri, C., Nico, G., Mane, E., & Brück, T.** 2025. Armed conflict and gendered participation in agrifood systems: Survey evidence from 29 African countries. *Global Food Security*, 44. https://doi.org/10.1016/j.gfs.2024.100821
106. **Annan, J., Blattman, C., Mazurana, D. & Carlson, K.** 2011. Civil war, reintegration, and gender in Northern Uganda. *Journal of Conflict Resolution*, 55(6): 877–908. https://doi.org/10.1177/0022002711408013
107. **Justino, P., Cardona, I., Mitchell, R. & Müller, C.** 2012. *Quantifying the impact of women's participation in post-conflict economic recovery*. HiCN Working Paper 131. University of Sussex, Falmer, UK, the Institute of Development Studies. https://opendocs.ids.ac.uk/articles/report/Quantifying_the_Impact_of_Women_s_Participation_in_Post-Conflict_Economic_Recovery/26482903/1

CHAPTER 7

1. **Yeboah, F.K. & Jayne, T.S.** 2018. Africa's evolving employment trends. *The Journal of Development Studies*, 54(5): 803–832. https://doi.org/10.1080/00220388.2018.1430767
2. **Barrett, C.B., Carter, M.R. & Timmer, C.P.** 2010. A century-long perspective on agricultural development. *American Journal of Agricultural Economics*, 92(2): 447–468. https://doi.org/10.1093/ajae/aaq005
3. **Christiaensen, L., Rutledge, Z. & Taylor, J.E.** 2021. Viewpoint: The future of work in agri-food. *Food Policy*, 99: 101963. https://doi.org/10.1016/j.foodpol.2020.101963
4. **Nouman, M., Khan, D., Ul Haq, I., Naz, N., Zahra, B.T.E. & Ullah, A.** 2022. Assessing the implication of green revolution for food security in Pakistan: A multivariate cointegration decomposition analysis. *Journal of Public Affairs*, 22(S1): e2758. https://doi.org/10.1002/pa.2758
5. **Reardon, T. & Timmer, C.** 2012. The economics of the food system revolution. *Annual Review of Resource Economics*, 4(1): 225–264.
6. **ILO**. 2024. *Global Employment Trends for Youth 2024. Decent work, brighter futures*. Geneva. www.ilo.org/publications/major-publications/global-employment-trends-youth-2024
7. **Filmer, D. & Fox, L.** 2014. *Youth employment in Sub-Saharan Africa*. Washington, DC, World Bank. https://doi.org/10.1596/978-1-4648-0107-5
8. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. p. 294. www.ifad.org/ruraldevelopmentreport
9. **Yeboah, T. & Flynn, J.** 2021. *Rural youth employment in Africa: An evidence review*. Evidence Synthesis Paper Series 10/2021. INCLUDE Knowledge Platform. https://opendocs.ids.ac.uk/articles/report/Rural_Youth_Employment_in_Africa_An_Evidence_Review/26432965?file=48082705
10. **Fabry, A., Van den Broeck, G. & Maertens, M.** 2022. Decent work in global food value chains: Evidence from Senegal. *World Development*, 152: 105790. https://doi.org/10.1016/j.worlddev.2021.105790
11. **Suzuki, A., Mano, Y. & Abebe, G.** 2018. Earnings, savings, and job satisfaction in a labor-intensive export sector: Evidence from the cut flower industry in Ethiopia. *World Development*, 110(C): 176–191.
12. **Timmer, C.P.** 1988. The agricultural transformation. In: H. Chenery & T.N. Srinivasan, eds.*Handbook of Development Economics*. Vol. 1. pp. 275–331. Amsterdam, the Netherlands, Elsevier Science Publishers. https://doi.org/10.1016/S1573-4471(88)01011-3
13. **Castillo, M.** 2023. *Green jobs, green economy, just transitions and related concepts: A review of definitions developed through intergovernmental processes and international organizations*. Geneva, International Labour Organization.
14. **Davis, B., de la O Campos, A.P., Farrae, M. & Winters, P.** 2024. Whither the agricultural productivity-led model? Reconsidering resilient and inclusive rural transformation in the context of agrifood systems. *Global Food Security*, 43: 100812. https://doi.org/10.1016/j.gfs.2024.100812
15. **Jayne, T.S., Yeboah, F.K. & Henry, C.** 2017. *The future of work in African agriculture trends and drivers of change*. ILO Working Papers. Geneva, International Labour Organization. https://ideas.repec.org//p/ilo/ilowps/994987492102676.html
16. **Jayne, T.S., Zingore, S., Niang, A.I., Palm, C., Shah, S. & Sanchez, P.** 2023. Building twenty-first century agricultural research and extension capacity in Africa. *European Review of Agricultural Economics*, 50(5): 1824–1846. https://doi.org/10.1093/erae/jbad028

17. **Fuglie, K., Gautam, M., Goyal, A. & Maloney, W.F.** 2020. *Harvesting prosperity: Technology and productivity growth in agriculture*. Washington, DC, World Bank. https://doi.org/10.1596/978-1-4648-1393-1
18. **Heisey, P. & Fuglie, K.** 2007. Economic returns to public agricultural research. USDA-ERS Economic Brief No. 10. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1084926
19. **Andersen, M.A.** 2015. Public investment in U.S. agricultural R&D and the economic benefits. *Food Policy*, 51: 38–43. https://doi.org/10.1016/j.foodpol.2014.12.005
20. **CGIAR (Consultative Group on International Agricultural Research)**. 2021. *Annual report 2020: CGIAR Research Program on Climate Change, Agriculture and Food Security*. Wageningen, the Netherlands, CGIAR Research Program on Climate Change, Agriculture and Food Security. https://hdl.handle.net/10568/115352
21. **Correa, C.M.** 2000. *Intellectual property rights, the WTO and developing countries: The TRIPS Agreement and policy options*. London, Zed Books.
22. **Asher, S. & Novosad, P.** 2020. Rural roads and local economic development. *American Economic Review*, 110(3): 797–823. https://doi.org/10.1257/aer.20180268
23. **Nga Ndjobo, P.M. & Abessolo, Y.A.** 2023. Access to paved roads, gender, and youth unemployment in rural areas: Evidence from sub-Saharan Africa. *African Development Review*, 35(2): 165–180. https://doi.org/10.1111/1467-8268.12701
24. **Shimamura, Y., Shimizutani, S., Yamada, E. & Yamada, H.** 2023. The gendered impact of rural road improvement on schooling decisions and youth employment in Morocco. *The Journal of Development Studies*, 59(3): 413–429. https://doi.org/10.1080/00220388.2022.2139608
25. **Mabiso, A. & Benfica, R.** 2019. The narrative on rural youth and economic opportunities in Africa: Facts, myths and gaps. *IFAD Research Series*, 61: 78.
26. **Nagler, P. & Naudé, W.** 2017. Non-farm entrepreneurship in rural sub-Saharan Africa: New empirical evidence. *Food Policy*, 67: 175–191. https://doi.org/10.1016/j.foodpol.2016.09.019
27. **Bandiera, O., Elsayed, A., Smurra, A. & Zipfel, C.** 2022. Young adults and labor markets in Africa. *Journal of Economic Perspectives*, 36(1): 81–100. https://doi.org/10.1257/jep.36.1.81
28. **Rud, J.P. & Trapeznikova, I.** 2021. Job creation and wages in least developed countries: Evidence from sub-Saharan Africa. *The Economic Journal*, 131(635): 1331–1364.
29. **Internationales Arbeitsamt & UNICEF, eds.** 2021. *Child labour: Global estimates 2020, trends and the road forward*. Geneva, International Labour Organization.
30. **ILO**. 2024. Fundamental principles and rights at work. In: *International Labour Organization*. Geneva. [Cited 21 January 2025]. www.ilo.org/projects-and-partnerships/projects/fundamental-principles-and-rights-work
31. **Babbit, L., Brown, D.K., Voegeli, E., Walters Antolín, A & Djaya, D**. 2019. *The benefits of fair recruitment: Results of the impact study on the Nepal-Jordan Corridor*. Geneva, International Labour Organization. https://researchrepository.ilo.org/esploro/outputs/encyclopediaEntry/The-benefits-of-fair-recruitment-results/995218763802676/filesAndLinks?index=0
32. **Geza, W., Ngidi, M., Ojo, T., Adetoro, A.A., Slotow, R. & Mabhaudhi, T.** 2021. Youth participation in agriculture: A scoping review. *Sustainability*, 13(16): 9120. https://doi.org/10.3390/su13169120
33. **ILO**. 2024. International Labour Standards. In: *International Labour Organization*. Geneva. [Cited 24 January 2025]. www.ilo.org/international-labour-standards
34. **FAO**. 2016. *Incorporating decent rural employment in the strategic planning for agricultural development*. Rome.
35. **ILO**. 2011. *Gaps in coverage and barriers to ratification and implementation of International Labour Standards in rural areas*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_norm/%40normes/documents/genericdocument/wcms_152771.pdf
36. **ILO**. 2024. *Recommendation R204 – Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204)*. Geneva. https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R204
37. **Raynolds, L.T.** 2014. Fairtrade, certification, and labor: Global and local tensions in improving conditions for agricultural workers. *Agricultural and Human Values*, 31: 499–511. https://doi.org/10.1007/s10460-014-9506-6
38. **Barrientos, S. & Smith, S**. 2007. Do workers benefit from ethical trade? Assessing codes of labour practice in global production systems. *Third World Quarterly*, 28(4): 713–729. https://doi.org/10.1080/01436590701336580
39. **Meemken, EM., Sellare, J., Kouame, C.N. & Qaim, M.** 2019. Effects of Fairtrade on the livelihoods of poor rural workers. *Nature Sustainability*, 2: 635–642. https://doi.org/10.1038/s41893-019-0311-5
40. **ILO**. 2015. *World Report on Child Labour 2015: Paving the way to decent work for young people*. Geneva. www.ilo.org/ipecinfo/product/download.do?type=document&id=26977
41. **Fairtrade Network of Asia & Pacific Producers**. undated. Youth Knowledge Hub (YKH) PROJECT in North & Central India. In: *Fairtrade Network of Asia & Pacific Producers*. Bonn, Germany. [Cited 20 December 2024]. www.fairtradenapp.org/youth-knowledge-hub-ykh-project-in-north-central-india
42. **ILO**. 2020. *Summary Report of Research Products Developed within the SafeYouth@Work Project (GLO/18/65/USA)*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_dialogue/%40lab_admin/documents/publication/wcms_734355.pdf
43. **US Department of Labor**. undated. eTools : Youth in . In: *Occupational Safety and Health Administration*. Washington, DC. [Cited 20 December 2024]. www.osha.gov/etools/youth-agriculture
44. **Hartling, L., Crumley, E.T., Klassen, T.P. & Pickett, W.** 2004. A Systematic Review of Interventions to Prevent Childhood Farm Injuries. *Pediatrics*, 114(4): e483–e496. https://doi.org/10.1542/peds.2003-1038-L
45. **Martha L. Sámano-Ríos, Ijaz, S., F. Curtis Breslin, J.R. & Karl Gummesson**. undated. Occupational safety and health interventions to protect young workers from hazardous work – A scoping review. *Safety Science*, 113: 389–403. https://doi.org/10.1016/j.ssci.2018.11.024
56. **Kazutaka, K.** 2012. Roles of participatory action-oriented programs in promoting safety and health at work. *Safetey and Health at Work*, 3(3): 155–165. https://doi.org/10.5491/SHAW.2012.3.3.155
47. **ILO**. 2023. *Côte d'Ivoire –- The WIND approach and strategic interventions on labour inspection: Improving working and living conditions through local solutions*. Geneva. www.ilo.org/media/108806/download
48. **IOM**. 2020. *Migration in West and North Africa and across the Mediterranean*. Grand-Saconnex, Switzerland. https://publications.iom.int/books/migration-west-and-north-africa-and-across-mediterranean
49. **Obi, C., Bartolini, F. & D'Haese, M.** 2019. Evaluating the impact of information campaign in deterring irregular migration intention among youths. A randomised control experiment in Edo State, Nigeria. Conference presentation at the 2019 Sixth International Conference, 23–26 September 2019, Abuja, Nigeria. https://ideas.repec.org//p/ags/aaae19/295934.html
50. **Tjaden, J. & Dunsch, F.A.** 2021. The effect of peer-to-peer risk information on potential migrants – Evidence from a randomized controlled trial in Senegal. *World Development*, 145: 105488. https://doi.org/10.1016/j.worlddev.2021.105488
51. **Bia-Zafinikamia, M-L., Tjaden, J. & Gninafon, H.** 2020. *The impact of mobile cinema events on potential migrants in Guinea: Impact evaluation report*. Geneva, IOM. https://publications.iom.int/books/impact-mobile-cinema-events-potential-migrants-guinea-impact-evaluation-report
52. **Barsbai, T.** 2018. *Pre-departure policies for migrants' origin countries*. PEGNet Policy Briefs 14/2018. Kiel, Germany, PEGNet - Poverty Reduction, Equity and Growth Network, Kiel Institute for the World Economy (IfW Kiel). https://ideas.repec.org//p/zbw/pegnpb/142018.html
53. **Dennison, J.** 2023. How Migrant Resource Centres affect migration decisions: Quasi-experimental evidence from Afghanistan, Bangladesh, Iraq and Pakistan. *International Migration*, 61(4): 104–119. https://doi.org/10.1111/imig.13082
54. **FAO**. 2022. Succeeding at home in Senegal. In: *Newsroom*. Rome. [Cited 28 March 2025]. www.fao.org/newsroom/story/Succeeding-at-home-in-Senegal/en
55. **IOM**. 2024. India: Joint initiative of FAO and IOM to tackle climate change-induced migration. In: *IOM*. Grand-Saconnex, Switzerland. [Cited 28 March 2025]. https://india.iom.int/news/india-joint-initiative-fao-and-iom-tackle-climate-change-induced-migration

56. **FAO**. 2024. Addressing climate-induced migration. In: *RuralEmployment*. Rome. [Cited 28 March 2025]. www.fao.org/rural-employment/projects/addressing-climate-induced-migration/en
57. **ILO**. 2021. Enterprise formalization: An introduction. In: *ILO*. Geneva. [Cited 20 December 2024]. www.ilo.org/publications/enterprise-formalization-introduction
58. **ILO**. 2024. Diagnostic analysis of informality in agriculture, agri-food, and construction. In: *ILO*. Geneva. [Cited 20 December 2024]. https://researchrepository.ilo.org/esploro/outputs/report/Diagnostic-analysis-of-informality-in-agriculture/995367393302676
59. **Yashodhan Ghorpade, Y., Franco Restrepo, C. & Castellanos, L.E.** 2024. *Social protection and labor market policies for the informally employed: A review of evidence from low- and middle-income countries*. Social Protection & Jobs Discussion Paper No. 2403. Washington, DC, World Bank Group. https://documents1.worldbank.org/curated/en/099032024211014718/pdf/P1810931d56c3a0fa1a1b3168e139e527a5.pdf
60. **Gentilini, U., Almenfi, M., Iyengar, H.T., Okamura, Y., Downes, J.A., Dale, P., Weber, M. *et al.*** 2022. *Social protection and jobs responses to COVID-19: A real-time review of country measures* (2 vols). Washington, DC, World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/110221643895832724/social-protection-and-jobs-responses-to-covid-19-a-real-time-review-of-country-measures
61. **Holzmann, R.** 2018. The portability of social benefits across borders. *IZA World of Labor*. Bonn, Germany, IZA Institute of Labor Economics. https://doi.org/10.15185/izawol.452
62. **FAO**. 2012. *Guiding principles for responsible contract farming operations*. Rome. www.fao.org/4/i2858e/i2858e.pdf
63. **Rasool, A., Badar, H., Blare, T.D., Ghafoor, A. & Mushtaq, K.** 2023. Farm productivity and social sustainability in formalized value chain governance: The case of the potato industry in Pakistan. *Renewable Agriculture and Food Systems*, 38: e52. https://doi.org/10.1017/S174217052300042X
64. **Marwaa, M.E. & Manda, J.** 2021. Do youth farmers benefit from participating in contract farming? Evidence from French beans youth farmers in Arusha, Tanzania. *Agricultural Economics Research and Practice in Southern Africa*, 61(4). https://doi.org/10.1080/03031853.2022.2099917
65. **Ntabakirabose, G., Tumukunde, R., Tuyisenge, J.C., Musabyimana, J.C, Mwehia Mburu, D., Theoneste Murindangabo, Y., Ndaruhutse, F. *et al.*** 2021. An economic analysis of the impact of contract farming of broccoli production on youth development: A case of Musanze District. *Innovation*, 2(4). https://article.sciencepublishinggroup.com/pdf/innov.20210204.12
66. **Soekarjo, D., Roshita, A., Thow, A.M., Li, M. & Rah, J.H.** 2018. Strengthening nutrition-specific policies for adolescents in Indonesia: A qualitative policy analysis. *Food and Nutrition Bulletin*, 39(3): 475–486. https://doi.org/10.1177/0379572118785054
67. **Owais, A., Merritt, C., Lee, C. & Bhutta, Z.A.** 2021. Anemia among women of reproductive age: An overview of global burden, trends, determinants, and drivers of progress in low- and middle-income countries. *Nutrients*, 13(8): 2745. https://doi.org/10.3390/nu13082745
68. **Osendarp, S.J.M., Martinez, H., Garrett, G.S., Neufeld, L.M., De-Regil, L.M., Vossenaar, M. & Darnton-Hill, I.** 2018. Large-scale food fortification and biofortification in low- and middle-income countries: A review of programs, trends, challenges, and evidence gaps. *Food and Nutrition Bulletin*, 39(2): 315–331. https://doi.org/10.1177/0379572118774229
69. **Ahmed, B. & Konje, J.C.** 2023. The epidemiology of obesity in reproduction. *Best Practice & Research: Clinical Obstetrics & Gynaecology*, 89: 102342–102342. https://doi.org/10.1016/j.bpobgyn.2023.102342
70. **Moran, L.J., Dodd, J., Nisenblat, V. & Norman, R.J.** 2011. Obesity and reproductive dysfunction in women. *Endocrinology and Metabolism Clinics of North America*, 40(4): 895–906. https://doi.org/10.1016/j.ecl.2011.08.006
71. **Chin, J.R., Murtaugh, M.A. & Silver, R.** 2014. Obesity: Implications for women's reproductive health. *Current Epidemiology Reports*, 1(1): 17–26. https://doi.org/10.1007/s40471-013-0003-z
72. **Carducci, B., Oh, C. & Bhutta, Z.A.** 2020. Addressing hidden hunger in school-aged children and adolescents within the context of the food system. In: H.K. Biesalski, ed. *Hidden hunger and the transformation of food systems: How to combat the double burden of malnutrition?* Basel, Switzerland, Karger. https://doi.org/10.1159/000507499
73. **Bhutta, Z.A., Lassi, Z.S., Bergeron, G., Koletzko, B., Salam, R.A., Diaz, A., Mclean, M. *et al.*** 2017. Delivering an action agenda for nutrition interventions addressing adolescent girls and young women. *Annals of the New York Academy of Sciences*, 1393(1): 61–71. https://doi.org/10.1111/nyas.13352
74. **Aguayo, V.M., Paintal, K. & Singh, G.** 2013. The adolescent girls' anaemia control programme: A decade of programming experience to break the inter-generational cycle of malnutrition in India. *Public Health Nutrition*, 16(9): 1667–1676. https://doi.org/10.1017/s1368980012005587
75. **Berggreen-Clausen, A., Hseing Pha, S., Mölsted Alvesson, H., Andersson, A. & Daivadanam, M.** 2022.. Food environment interactions after migration: A scoping review on low- and middle-income country immigrants in high-income countries. *Public Health Nutrition*, 25(1): 136–158. https://doi.org/10.1017/S1368980021003943
76. **Adelman, S., Gilligan, D.O., Konde-Lule, J. & Alderman, H.** 2019. School feeding reduces anemia prevalence in adolescent girls and other vulnerable household members in a cluster randomized controlled trial in Uganda. *The Journal of Nutrition*, 149(4): 659–666. https://doi.org/10.1093/jn/nxy305
77. **WFP**. 2022. *Synthesis of evaluations. Evaluation series on emergency school feeding in the Democratic Republic of Congo, Lebanon, Niger and Syria (2015–2019)*. Rome. www.wfp.org/publications/school-feeding-emergencies-synthesis-evaluation
78. **Hartwig, K.A. & Mason, M.** 2016. Community gardens for refugee and immigrant communities as a means of health promotion. *Journal of Community Health*, 41(6): 1153–1159. https://doi.org/10.1007/s10900-016-0195-5
79. **Oliveira, B., Bicho, M. & Valente, A.** 2023. Development and implementation of a nutritional education program aimed at improving the integration process of young orphan refugees newly arrived in Portugal. *Nutrients*, 15(2): 408. https://doi.org/10.3390/nu15020408
80. **Peterson, A.** 2011. "Repeat after me". Engaging refugee youth in nutrition and food safety education without a translator. *Journal of Nutrition Education and Behavior*, 43(4): S39. https://doi.org/10.1016/j.jneb.2011.03.117
81. **Saeedullah, A., Khan, M.S., Andrews, S.C., Iqbal, K., Ul-Haq, Z., Qadir, S.A., Khan, H. *et al.*** 2021. Nutritional status of adolescent Afghan refugees living in Peshawar, Pakistan. *Nutrients*, 13(9): 3072. https://doi.org/10.3390/nu13093072
82. **Khuri, J., Wang, Y., Holden, K., Fly, A.D., Mbogori, T., Mueller, S., Kandiah, J. *et al.*** 2022. Dietary intake and nutritional status among refugees in host countries: A systematic review. *Advances in Nutrition*, 13(5): 1846–1865. https://doi.org/10.1093/advances/nmac051
83. **Nisbet, C., Lestrat, K.E. & Vatanparast, H.** 2022. Food security interventions among refugees around the globe: A scoping review. *Nutrients*, 14(3): 522. https://doi.org/10.3390/nu14030522
84. **Ekezie, W.** 2022. Resilience actions of Internally Displaced Persons (IDPs) living in camp-like settings: A Northern Nigeria case study. *Journal of Migration and Health*, 6: 100115. https://doi.org/10.1016/j.jmh.2022.100115
85. **Vallet, M.E., Frankenberger, T.R., Presnall, C., Otieno, L., Fu, C. & Lee, E.** 2021. Where are the development actors in protracted crises? Refugee livelihood and food security outcomes in South Sudan demonstrate the potential for fragile settings. *World Development Perspectives*, 24: 100366. https://doi.org/10.1016/j.wdp.2021.100366
86. **Laska, M.N., Larson, N.I., Neumark-Sztainer, D. & Story, M.** 2012. Does involvement in food preparation track from adolescence to young adulthood and is it associated with better dietary quality? Findings from a 10-year longitudinal study. *Public Health Nutrition*, 15(7): 1150–1158. https://doi.org/10.1017/S1368980011003004
87. **Quelly, S.B.** 2019. Helping with meal preparation and children's dietary intake: A literature review. *The Journal of School Nursing*, 35(1): 51–60. https://doi.org/10.1177/1059840518781235
88. **Utter, J., Larson, N., Laska, M.N., Winkler, M. & Neumark-Sztainer, D.** 2018. Self-perceived cooking skills in emerging adulthood predict better dietary behaviors and intake 10 years later: A longitudinal study. *Journal of Nutrition Education and Behavior*, 50(5): 494–500. https://doi.org/10.1016/j.jneb.2018.01.021
89. **Di Pasquale, R. & Rivolta, A.** 2018. A conceptual analysis of food parenting practices in the light of self-determination theory: Relatedness-enhancing, competence-enhancing and autonomy-enhancing food parenting practices. *Frontiers in Psychology*, 9. https://doi.org/10.3389/fpsyg.2018.02373

90. **Stronger Foundations for Nutrition**. 2024. *Nourish Equality: Promote girls' education*. https://stronger-foundations.org/wp-content/uploads/2024/09/Nourish_Equality_Girls-Education.pdf
91. **Local Burden of Disease Educational Attainment Collaborators**. 2020. Mapping disparities in education across low- and middle-income countries. *Nature*, 577(7789): 235–238. https://doi.org/10.1038/s41586-019-1872-1
92. **Wang, D., Shinde, S., Young, T. & Fawzi, W.W.** 2021. Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low- and middle-income countries: A systematic review and meta-analysis. *Journal of Global Health*, 11: 1–27. https://doi.org/10.7189/jogh.11.04051
93. **Kristjansson, E.A., Robinson, V., Petticrew, M., MacDonald, B., Krasevec, J., Janzen, L., Greenhalgh, T. *et al.*** 2007. *School feeding for improving the physical and psychosocial health of disadvantaged students*. New York, USA, John Wiley and Sons Ltd. https://researchonline.lshtm.ac.uk/id/eprint/8764/1/Kristjansson_et_al-2007-The_Cochrane_library.pdf
94. **Durão, S., Wilkinson, M., Davids, E.L., Gerritsen, A. & Kredo, T.** 2024. Effects of policies or interventions that influence the school food environment on children's health and nonhealth outcomes: a systematic review. *Nutrition Reviews*, 82(3): 332–360. https://doi.org/10.1093/nutrit/nuad059
95. **Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L.P., Story, M., Peñalvo, J.L. *et al.*** 2018. Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PLOS ONE*, 13(3): e0194555. https://doi.org/10.1371/journal.pone.0194555
96. **Andueza, N., Navas-Carretero, S. & Cuervo, M.** 2022. Effectiveness of nutritional strategies on improving the quality of diet of children from 6 to 12 years old: A systematic review. *Nutrients*, 14(2): 372. www.mdpi.com/2072-6643/14/2/372
97. **Cohen, J.F.W., Hecht, A.A., McLoughlin, G.M., Turner, L. & Schwartz, M.B.** 2021. Universal school meals and associations with student participation, attendance, academic performance, diet quality, food security, and body mass index: A systematic review. *Nutrients*, 13(3): 1–41. https://doi.org/10.3390/nu13030911
98. **Verstraeten, R., Roberfroid, D., Lachat, C., Leroy, J.L., Holdsworth, M., Maes, L. & Kolsteren, P.W.** 2012. Effectiveness of preventive school-based obesity interventions in low- and middle-income countries: A systematic review. *The American Journal of Clinical Nutrition*, 96(2): 415–438. https://doi.org/10.3945/ajcn.112.035378
99. **Capper, T.E., Brennan, S.F., Woodside, J. V & McKinley, M.M.** 2022. What makes interventions aimed at improving dietary behaviours successful in the secondary school environment? A systematic review of systematic reviews. *Public Health Nutrition*, 25(9): 1–17. https://doi.org/10.1017/S1368980022000829
100. **O'Brien, K.M., Barnes, C., Yoong, S., Campbell, E., Wyse, R., Delaney, T., Brown, A. *et al.*** 2021. School-based nutrition interventions in children aged 6 to 18 years: An umbrella review of systematic reviews. *Nutrients*, 13(11): 1–31. https://doi.org/10.3390/nu13114113
101. **Tamiru, D., Argaw, A., Gerbaba, M., Ayana, G., Nigussie, A., Jisha, H. & Belachew, T.** 2017. Enhancing personal hygiene behavior and competency of elementary school adolescents through peer-led approach and school-friendly: A quasi-experimental study. *Ethiopian Journal of Health Sciences*, 27(3): 245–254. https://doi.org/10.4314/ejhs.v27i3.6
102. **Iron-Segev, S., Lusweti, J.N., Kamau-Mbuthia, E. & Stark, A.H.** 2018. Impact of community-based nutrition education on geophagic behavior and dietary knowledge and practices among rural women in Nakuru Town, Kenya: A pilot study. *Journal of Nutrition Education and Behavior*, 50(4): 408–414.e1. https://doi.org/10.1016/j.jneb.2017.10.013
103. **Khizar, M., Ruel-Bergeron, J., Zavala, E., Chang, K., Kang, Y. & de Pee, S.** 2024. Delivery platforms for reaching adolescents with nutrition interventions in low- and middle-income countries. *Annals of the New York Academy of Sciences*, 1538(1): 71–84. https://doi.org/10.1111/nyas.15196
104. **Chau, M.M., Burgermaster, M. & Mamykina, L.** 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. https://doi.org/10.1016/j.ijmedinf.2018.10.001
105. **Reeve, B. & Magnusson, R.** 2018. Regulation of food advertising to children in six jurisdictions: A framework for analyzing and improving the performance of regulatory instruments. Sydney Law School Research Paper 18/09. *Arizona Journal of International and Comparative Law*, 35(1). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3131414
106. **Alfraidi, A., Alafif, N. & Alsukait, R.** 2023. The impact of mandatory food-marketing regulations on purchase and exposure: A narrative review. *Children*, 10(8): 1277. https://doi.org/10.3390/children10081277
107. **Khan, R., Suggs, L.S., Tanweer, A. & Bányai, G.** 2024. Food advertisement and marketing policies aimed at reducing childhood obesity: A review of existing regulations in high-income countries. *Public Health Reviews*, 45: 1607103. https://doi.org/10.3389/phrs.2024.1607103
108. **Freeman, B., Kelly, B., Vandevijvere, S. & Baur, L.** 2015. Young adults: Beloved by food and drink marketers and forgotten by public health? *Health Promotion International*, 31(4): 954–961. https://doi.org/10.1093/heapro/dav081
109. **Elliott, C.** 2018. "Grab gatorade!": Food marketing, regulation and the young consumer. *European Journal of Marketing*, 52(12): 2520–2531. https://doi.org/10.1108/EJM-05-2018-0355
110. **Kucharczuk, A.J., Oliver, T.L. & Dowdell, E.B.** 2022. Social media's influence on adolescents' food choices: A mixed studies systematic literature review. *Appetite*, 168: 105765. https://doi.org/10.1016/j.appet.2021.105765
111. **Elliott, C.** 2017. Knowledge needs and the "savvy" child: Teenager perspectives on banning food marketing to children. *Critical Public Health*, 27(4): 430–442. https://doi.org/10.1080/09581596.2016.1240356
112. **Grier, S.A. & Kumanyika, S.** 2010. Targeted marketing and public health. *Annual Review of Public Health*, 31(1): 349–369. https://doi.org/10.1146/annurev.publhealth.012809.103607
113. **Masilo, S.** 2024. The importance of front-of-pack labelling. In: *Activating Youth Activism*. [Cited 18 January 2025]. https://creators.spotify.com/pod/show/activating-youth-activism/episodes/The-Importance-of-Front-of-Pack-Labelling--Hosted-by-Simphiwe-Masilo-e2nido4/a-abgbntp
114. **Sugar Industry Innovation Symposium**. 2025. Youth advocacy for policy reforms in the sugar industry. In: *Sugar Industry Innovation Symposium*. [Cited 8 May 2025]. www.sugarinnovation.org/thematic-areas/youth-advocacy-for-policy-reforms-in-the-sugar-industry/3
115. **Honey, P.** 2024. Youth voices in action: Advocating for healthier kids' meals. In: *Teens for Food Justice*. (Cited 22 May 2025) https://teensforfoodjustice.org/blog/youth-voices-in-action-advocating-for-healthier-kids-meals
116. **Linton, L.S., Edwards, C.C., Woodruff, S.I., Millstein, R.A. & Moder, C.** 2014. Youth advocacy as a tool for environmental and policy changes that support physical activity and nutrition: An evaluation study in San Diego County. *Preventing Chronic Disease*, 11: E46. https://doi.org/10.5888/pcd11.130321
117. **Shostak, S. & Guscott, N.** 2017. "Grounded in the neighborhood, grounded in community": Social capital and health in community gardens. In: S. Shostak, ed. *Advances in Medical Sociology*. pp. 199–222. Vol. 18. Bradford, UK, Emerald Publishing Limited. https://doi.org/10.1108/S1057-629020170000018009
118. **ElDidi, H., Bidoli, T. & Ringler, C.** 2020. *Agriculture and youth in Nigeria: Aspirations, challenges, constraints, and resilience*. IFPRI Discussion Paper 01946. Washington, DC, International Food Policy Research Institute. https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3650356_code1123746.pdf?abstractid=3650356&mirid=1
119. **Arslan, A., Belotti, F. & Lipper, L.** 2017. Smallholder productivity and weather shocks: Adoption and impact of widely promoted agricultural practices in Tanzania. *Food Policy*, 69: 68–81. https://doi.org/10.1016/j.foodpol.2017.03.005
120. **Tadesse, B. & Ahmed, M.** 2023. Impact of adoption of climate smart agricultural practices to minimize production risk in Ethiopia: A systematic review. *Journal of Agriculture and Food Research*, 13: 100655. https://doi.org/10.1016/j.jafr.2023.100655
121. **Amadu, F.O., McNamara, P.E. & Miller, D.C.** 2020. Understanding the adoption of climate-smart agriculture: A farm-level typology with empirical evidence from southern Malawi. *World Development*, 126: 104692. https://doi.org/10/ggvw7t
122. **FAO**. 2024. *The unjust climate: Measuring the impacts of climate change on rural poor, women and youth*. Rome. https://doi.org/10.4060/cc9680en
123. **Ulrichs, M., Costella, C., Holmes, R., Spano, F. & Ocampo, A.** 2019. *Managing climate risks through social protection*. Rome, FAO. https://openknowledge.fao.org/items/f65ae6b6-129c-47fd-9e56-8ae3f0ffd9d4

124. **Schneider, K.R., De La O Campos, A.P., Cavatassi, R. & Davis, B.** 2024. Resilient and inclusive rural transformation in sub-Saharan Africa under climate, demographic, and social change: Challenges and opportunities for income growth and job creation. *Global Food Security*, 43: 100815. https://doi.org/10.1016/j.gfs.2024.100815

125. **Asfaw, S. & Davis, B.** 2018. Can cash transfer programmes promote household resilience? Cross-country evidence from Sub-Saharan Africa. In: L. Lipper, N. McCarthy, D. Zilberman, S. Asfaw & G. Branca, eds. *Climate smart agriculture: Building resilience to climate change.* pp. 227–250. Cham, Switzerland, Springer. https://doi.org/10.1007/978-3-319-61194-5_11

126. **Correa, J.S., Daidone, S., Davis, B. & Sitko, N.J.** 2023. *Social protection and rural transformation in Africa*. Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/cc5112en

127. **Araujo, C., Baird, S., Das, S., Ozler, B., Parisotto, L. & Woldehanna, W.** 2024. *Social Protection and Youth.* Policy Research Working Paper 10832. Washington, DC, World Bank. https://dds.cepal.org/redesoc/publicacion?id=6062

128. **Knippenberg, E. & Hoddinott, J.** 2019. *Shocks, social protection, and resilience: Evidence from Ethiopia*. Seoul, Ethiopan Development Research Institute. https://dqo52087pnd5x.cloudfront.net/posters/docs/gatesopenres-183090.pdf

129. **McIntosh, C. & Zeitlin, A.** 2022. Using household grants to benchmark the cost effectiveness of a USAID workforce readiness program. *Journal of Development Economics*, 157: 102875. https://doi.org/10.1016/j.jdeveco.2022.102875

130. **Rosas, N., Acevedo, M.C. & Zaldivar, S.** 2022. Starting points matter: Cash plus training effects on youth entrepreneurship, skills, and resilience during an epidemic. *World Development*, 149: 105698. https://doi.org/10.1016/j.worlddev.2021.105698

131. **Blattman, C., Fiala, N. & Martinez, S.** 2014. Generating skilled self-employment in developing countries: Experimental evidence from Uganda. *The Quarterly Journal of Economics*, 129(2): 697–752. https://doi.org/10.1093/qje/qjt057

132. **Blattman, C., Fiala, N. & Martinez, S.** 2020. The long-term impacts of grants on poverty: Nine-year evidence from Uganda's Youth Opportunities Program. *American Economic Review: Insights*, 2(3): 287–304. https://doi.org/10.1257/aeri.20190224

133. **Baird, S., McIntosh, C. & Özler, B.** 2011. Cash or condition? Evidence from a cash transfer experiment. *The Quarterly Journal of Economics*, 126(4): 1709–1753.

134. **IFAD**. 2024. *Promoting financial inclusion through digitalization of remittances*. Rome. www.ifad.org/documents/48415603/49747559/gpfi-report-2024.pdf/02bfc17b-5462-bbff-46fd-e51ad625f7fd?t=1726641643380

135. **Bryan, G., Chowdhury, S. & Mobarak, A.M.** 2016. Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh. *Econometrica*, 82(5): 1671–1748. https://poverty-action.org/sites/default/files/publications/Under-investment%20in%20a%20Profitable%20Technology.pdf

136. **UNESCO**. 2019. *2019 Global Education Monitoring Report*. Paris, UNESCO Publishing. https://gem-report-2019.unesco.org

137. **UNEN**. 2024. *Migration and human capital*. Policy Brief. New York, USA. www.un.org/fr/file/189622/download?token=k635ETWc

138. **UNCDF (United Nations Capital Development Fund)**. undated. Access to and usage of digital remittances: A case study of SentBe. In: *Migrant Money*. [Cited 28 March 2025]. https://migrantmoney.uncdf.org/resources/insights/access-to-and-usage-of-digital-remittances-a-case-study-of-sentbe

139. **UNICEF**. 2024. Meaningful youth engagement in the multilateral system. In: *Innocenti Global Office of Research and Foresight*. New York, USA. [Cited 15 November 2024]. www.unicef.org/innocenti/reports/meaningful-youth-engagement-multilateral-system

140. **Thew, H., Middlemiss, L. & Paavola, J.** 2022. "You need a month's holiday just to get over it!" Exploring young people's lived experiences of the UN Climate Change Negotiations. *Sustainability*, 14(7): 1–21.

141. **Madden, A., MacInnis, J. & Yanes, N.M.** 2024. Advocating for food sovereignty in the UN Committee on World Food Security: Facilitating young people's participation in policy making. In: J. Bessant, P. Collin & P. O'Keeffe, eds. *Research handbook on the sociology of youth*. pp. 268–285. Cheltenham, UK, Edward Elgar Publishing. www.elgaronline.com/edcollchap/book/9781803921808/book-part-9781803921808-32.xml

142. **Cho, A., Byrne, J. & Pelter, Z.** 2020. *Digital civic engagement by young people*. New York, USA, UNICEF. www.unicef.org/media/72436/file/Digital-civic-engagement-by-young-people-2020_4.pdf

143. **Tomaž, D.** 2023. *Young people's participation in European democratic processes: How to improve and facilitate youth involvement*. Brussels, European Parliament. www.europarl.europa.eu/RegData/etudes/STUD/2023/745820/IPOL_STU(2023)745820_EN.pdf

144. **Garza-Vázquez, O.** 2022. Collective agency freedom as the engine of a common good dynamic: A conceptual proposal for measurement. In: M. Nebel, O. Garza-Vázquez & C. Sedmak, eds. *A common good approach to development*. First edition, pp. 145–178. Cambridge, UK, Open Book Publishers. https://doi.org/10.11647/OBP.0290.06

145. **Ibrahim, S.** 2020. Individualism and the capability approach. In: E. Chiappero-Martinetti, S. Osmani & M. Qizilbash, eds. *The Cambridge Handbook of the Capability Approach*. First edition. pp. 206–226. Cambridge, UK, Cambridge University Press. https://doi.org/10.1017/9781316335741

146. **Proctor, F. & Lucchesi, V.** 2012. *Small-scale farming and youth in an era of rapid rural change.* London/The Hague, International Institute for Environment and Development/HIVOS. www.iied.org/sites/default/files/pdfs/migrate/14617IIED.pdf

147. **Rauschmayer, F., Polzin, C., Mock, M. & Omann, I.** 2018. Examining collective action through the capability approach: The example of community currencies. *Journal of Human Development and Capabilities*, 19(3): 345–364. https://doi.org/10.1080/19452829.2017.1415870

148. **Yami, M., Feleke, S., Abdoulaye, T., Alene, A.D., Bamba, Z. & Manyong, V.** 2019. African rural youth engagement in agribusiness: Achievements, limitations, and lessons. *Sustainability*, 11(1): 185. https://doi.org/10.3390/su11010185

149. **Grandelis, I., Ho, H. & Storchi, S.** 2024. *Youth agripreneurship and pathways of change*. Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/cd0510en

150. **International Land Coalition**. 2024. Jóvenes rurales de Colombia se unen para contribuir a la política pública [Rural youth in Colombia join forces to contribute to public policy]. In: *ILC LAC*. Rome. [Cited 21 December 2024]. https://lac.landcoalition.org/es/noticias/jovenes-rurales-de-colombia-se-unen-para-contribuir-a-la-politica-publica

151. **Flink, I., Vaast, C. & Jacobs, J.** 2018. *Youth in agricultural cooperatives: Challenges and opportunities*. Amsterdam, Tropical Institute (KIT)/Centre for Development Innovation (CDI)/Young Professionals for Agricultural Development (YPARD). www.kit.nl/wp-content/uploads/2018/08/5afea67b54b07_180405_kit-youth-agri-coop_report-def.pdf

152. **Vicari, S., Berranger, C. & Rinaldi**. 2020. *Investing responsibly in agriculture through smallholder cooperatives: Insights from Uganda*. Working Paper No. 258. Rome, Dipartimento di Economia Università degli studi di Roma Tre. https://economia.uniroma3.it/wp-content/uploads/sites/5/file_locked/2021/01/WP258.pdf

153. **FAO**. 2023. *Good performance and inclusiveness of poor people in cooperatives and other producer organizations: A possible match?* Rome. https://doi.org/10.4060/cc4917en

154. **FAO, CTA & IFAD, eds.** 2014. *Youth and agriculture: Key challenges and concrete solutions*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/408708f0-82dc-418e-b92b-e2d7ec0cd2e6/content

155. **Giuliani, A., Mengel, S., Paisley, C., Perkins, N., Flink, I., Oliveros, O. & Wongtschowski, M.** 2017. Realities, perceptions, challenges and aspirations of rural youth in dryland agriculture in the Midelt Province, Morocco. *Sustainability*, 9(6): 871. https://doi.org/10.3390/su9060871

156. **Policy LINK**. 2023. *Mapping Of Africa youth-led organizations in agricultural development and climate change*. Washington, DC, USAID.

157. **UNICEF**. undated. Adolescent empowerment. Technical Note. In: *UNICEF*. New York, USA. [Cited 6 December 2024]. www.unicef.org/adolescent-empowerment-technical-note

158. **Biggeri, M., Ballet, J. & Comim, F.** 2011. The capability approach and research on children: Capability approach and children's issues. In: S. Andresen, I. Diehm, U. Sander & H. Ziegler, eds. *Children and the good life: New challenges for research on children*. pp. 75–89. Dordrecht, the Netherlands, Springer. https://doi.org/10.1007/978-90-481-9219-9_6

159. **McKenzie, D.** 2020. *Small business training to improve management practices in developing countries: Reassessing the evidence for "training doesn't work"*. Policy Research Working Paper 9408. Washington, DC, World Bank. https://documents1.worldbank.org/curated/en/593081600709463800/pdf/Small-Business-Training-to-Improve-Management-Practices-in-Developing-Countries-Reassessing-the-Evidence-for-Training-Doesn-t-Work.pdf

160. **BenYishay, A. & Mobarak, A.M.** 2019. Social learning and incentives for experimentation and communication. *The Review of Economic Studies*, 86(3): 976–1009. https://doi.org/10.1093/restud/rdy039

161. **Garaika & Margahana, H.** 2018. Self efficacy, self personality and self confidence on entrepreneurial intention: Study on young enterprises. *Journal of Entrepreneurship Education*, 22(1): 1–275. www.abacademies.org/articles/Self-efficacy-self-personality-and-self-confidence-on-entrepreneurial-intention-1528-2651-22-1-275.pdf

162. **FAO**. 2022. *Youth Inspiring Youth in Agriculture initiative*. Kampala. https://openknowledge.fao.org/handle/20.500.14283/cc0677en

163. **HLPE**. 2021. *Promoting youth engagment and employment in agriculture and food systems*. HLPE report 16. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/034c7cf9-9215-4304-a264-ecb0215a50d2/content

164. **Zeldin, S., Christens, B.D. & Powers, J.L**. 2012. The psychology and practice of youth-adult partnership: Bridging generations for youth development and community change. *American Journal of Coumminty Psychology*, 51(3–4): 385–397. https://fyi.extension.wisc.edu/youthadultpartnership/files/2012/10/Am-Journal-of-Community-Psych-paper.pdf

165. **Nugraha, Y.A.** 2022. Do parents introduce agricultural livelihood towards rural-youth? Understanding communication pattern between parents and rural-youth related to agricultural livelihood in Ciasmara Village, Pamijahan Sub-district, Bogor Regency. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian dan Agribisnis*, 21(1): 1131–1146. https://doi.org/10.31186/JAGRISEP.21.1.131-146

166. **FAO**. 2023. Dimitra Clubs: Leaving no one behind through community engagement and women's empowerment. *FAO Knowledge Repository.* Rome. [Cited 6 December 2024]. https://openknowledge.fao.org/items/58f94961-f3f6-45a1-b826-9beffa442bae

167. **Zimmerman, L.A., Li, M., Moreau, C., Wilopo, S. & Blum, R.** 2019. Measuring agency as a dimension of empowerment among young adolescents globally; findings from the Global Early Adolescent Study. *SSM - Population Health*, 8: 100454. https://doi.org/10.1016/j.ssmph.2019.100454

168. **Ingram, J. & Kirwan, J.** 2011. Matching new entrants and retiring farmers through farm joint ventures: Insights from the Fresh Start Initiative in Cornwall, UK. *Land Use Policy*, 28(4): 917–927. https://doi.org/10.1016/j.landusepol.2011.04.001

169. **Bika, Z.** 2007. The territorial impact of the farmers' early retirement scheme. *Sociologia Ruralis*, 47(3): 246–272. https://doi.org/10.1111/j.1467-9523.2007.00436.x

170. **Zagata, L., Hrabák, J., Lošťák, M., Bavorová, M., Ratinger, T., Sutherland, L-A. & McKee, A.** 2017. *Research for AGRI Committee: Young farmers – Policy implementation after the 2013 CAP reform*. Brussels, European Parliament, Directorate Gerneral for Internal Policies. www.europarl.europa.eu/RegData/etudes/STUD/2017/602006/IPOL_STU(2017)602006_EN.pdf

171. **Nordin, M. & Lovén, I.** 2020. Is the setting up aid mitigating the generational renewal problem in farming? *European Review of Agricultural Economics*, 47(5): 1697–1715. https://doi.org/10.1093/erae/jbaa006

172. **May, D., Arancibia, S., Behrendt, K. & Adams, J.** 2019. Preventing young farmers from leaving the farm: Investigating the effectiveness of the young farmer payment using a behavioural approach. *Land Use Policy*, 82: 317–327. https://doi.org/10.1016/j.landusepol.2018.12.019

173. **Farrell, M., Murtagh, A., Weir, L., Conway, S.F., McDonagh, J. & Mahon, M.** 2022. Irish organics, innovation and farm collaboration: A pathway to farm viability and generational renewal. *Sustainability*, 14(1): 93. https://doi.org/10.3390/su14010093

174. **Heider, K., Rodriguez Lopez, J.M., Balbo, A.L. & Scheffran, J.** 2021. The state of agricultural landscapes in the Mediterranean: Smallholder agriculture and land abandonment in terraced landscapes of the Ricote Valley, southeast Spain. *Regional Environmental Change*, 21(1): 23. https://doi.org/10.1007/s10113-020-01739-x

175. **Borda, Á.J., Sárvári, B. & Balogh, J.M.** 2023. Generation change in agriculture: A systematic review of the literature. *Economies*, 11(5): 129. https://doi.org/10.3390/economies11050129

176. **Chiran, A., Jităreanu, A.F., Gîndu, E. & Ciornei, L.** 2016. Development of rural tourism and agrotourism in some European countries. *Lucrări Științifice Management Agricol*, 18(1): 225. www.lsma.ro/index.php/lsma/article/view/955/pdf

177. **Tem, S., Kuroda, A. & Tang, K.N.** 2024. The birth of millennial farmers and their role in the development of agritourism in Garut Regency. *Journal of Law, Social Science and Humanities*, 1(2): 25–35. https://myjournal.or.id/index.php/JLSSH/article/view/66/77

178. **FAO**. 2020. *Migrant workers and the COVID-19 pandemic*. Rome. https://openknowledge.fao.org/handle/20.500.14283/ca8559en

179. **Adhikari, S., Changom, N., Kaila, H.K. & Shrestha, M.** 2024. *Do bilateral labor agreements increase migration ? Global evidence from 1960 to 2020*. Policy Research Working Paper Series 11000. Washington, DC, World Bank. https://ideas.repec.org//p/wbk/wbrwps/11000.html

180. **FAO**. 2018. *The State of Food and Agriculture 2018. Migration, agriculture and rural development*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/0106019d-2529-4f93-b9e5-cce52bee33c3/content

181. **ILO**. 2022. *Synthesis report: Temporary labour migration: Unpacking complexities.* Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_protect/%40protrav/%40migrant/documents/publication/wcms_858541.pdf

182. **US Citizenship and Immigration Services**. 2025. H-2A Temporary agricultural workers. In: *USCIS*. Washington, DC. [Cited 27 March 2025]. www.uscis.gov/working-in-the-united-states/temporary-workers/h-2a-temporary-agricultural-workers

183. **Government of Canada.** 2015. Hire a temporary worker through the Seasonal Agricultural Worker Program – Overview. In: *Employment and Social Development Canada.* Ottawa. [Cited 27 March 2025]. www.canada.ca/en/employment-social-development/services/foreign-workers/agricultural/seasonal-agricultural.html

184. **Pacific Australia Labour Mobility**. undated. PALM scheme. In: *PALM*. Canberra. [Cited 27 March 2025]. www.palmscheme.gov.au

185. **New Zealand Immigration**. undated. Recognised Seasonal Employer (RSE) Scheme. In: *Immigration New Zealand*. Wellington. [Cited 27 March 2025]. www.immigration.govt.nz/about-us/media-centre/common-topics/recognised-seasonal-employer-rse-scheme

186. **Korea Immigration Service**. undated. Republic of Korea Seasonal Worker Program (SWP). In: *Ministry of Justice*. Seoul. [Cited 27 March 2025]. www.immigration.go.kr:443/immigration_eng/1860/subview.do

187. **European Commission**. undated. Seasonal workers Directive. In: *European Commission*. Brussels. [Cited 27 March 2025]. https://home-affairs.ec.europa.eu/policies/migration-and-asylum/legal-migration-resettlement-and-integration/work/seasonal-workers-directive_en

188. **Gibson, J. & McKenzie, D.** 2010. *The development impact of a best practice seasonal worker policy*. RF Berlin – CReAM Discussion Paper Series 1029. Berlin, Rockwool Foundation Berlin (RF Berlin) – Centre for Research and Analysis of Migration (CReAM). https://ideas.repec.org//p/crm/wpaper/1029.html

189. **ILO**. 2024. International Standard Classification of Occupations (ISCO). In: *ILOSTAT*. Geneva. [Cited 5 November 2024]. https://ilostat.ilo.org/methods/concepts-and-definitions/classification-occupation

190. **African Union & OECD (Organisation for Economic Co-operation and Development)**. 2024. *Africa's development dynamics 2024: Skills, jobs and productivity*. Addis Ababa/Paris. www.oecd.org/en/publications/africa-s-development-dynamics-2024_df06c7a4-en.html

191. **Dzingirai, M.** 2021. The role of entrepreneurship in reducing poverty in agricultural communities. *Journal of Enterprising Communities: People and Places in the Global Economy*, 15(5): 665–683. https://doi.org/10.1108/JEC-01-2021-0016

192. **UNICEF**. 2024. *Skills for a green transition: Solutions for youth on the move.* New York, USA. www.unicef.org/reports/skills-green-transition

193. **Maïga, W.H.E., Porgo, M., Zahonogo, P., Amegnaglo, C.J., Coulibaly, D.A., Flynn, J., Seogo, W. *et al.*** 2020. A systematic review of employment outcomes from youth skills training programmes in agriculture in low- and middle-income countries. *Nature Food*, 1(10): 605–619. https://doi.org/10.1038/s43016-020-00172-x

194. **Puerto, S., Stöterau, J., Weber, M. & Curcio, C.** 2024. *Active labour market programs improve employment and earnings of young people*. Geneva, International Labour Organization. www.ilo.org/publications/active-labour-market-programs-improve-employment-and-earnings-young-people

195. **Kluve, J., Puerto, S., Robalino, D., Romero, J.M., Rother, F., Stöterau, J., Weidenkaff, F. *et al.*** 2019. Do youth employment programs improve labor market outcomes? A quantitative review. *World Development*, 114: 237–253. https://doi.org/10.1016/j.worlddev.2018.10.004

196. **Puerto Gonzalez, S., Curcio, C., Bausch, J., Stöterau, J. & Weber, M.** 2022. *The impact of active labour market programmes on youth. An updated systematic review and meta-analysis*. Geneva, ILO.

197. **Ismail, O.** 2016. What is in a Job? The social context of youth employment issues in Africa. *Journal of African Economies*, 25(suppl 1): i37–i60. https://doi.org/10.1093/jae/ejv028

198. **Alrawashdeh, G.S., Lindgren, S., Reyes, M. & Pisey, S.** 2023. Engaging youth at school to advance sustainable agriculture and inspire future farming: Evidence from Cambodia. *Journal of Agricultural Education and Extension*, 29(5): 539–556. https://doi.org/10.1080/1389224X.2022.2117213

199. **Adeyanju, D., Mburu, J. & Mignouna, D.** 2021. Youth agricultural entrepreneurship: Assessing the impact of agricultural training programmes on performance. *Sustainability*, 13(4): 1697. https://doi.org/10.3390/su13041697

200. **Ng'atigwa, A.A., Hepelwa, A., Yami, M. & Manyong, V.** 2020. Assessment of factors influencing youth involvement in horticulture agribusiness in Tanzania: A case study of Njombe Region. *Agriculture*, 10(7): 287. https://doi.org/10/gg5hk5

201. **Shoulders, C., Barrick, R. & Myers, B.** 2011. An assessment of the impact of internship programs in the agricultural technical schools of Egypt as perceived by participants groups. *Journal of International Agricultural and Extension Education*, 18(2): 18–29. https://doi.org/10.5191/jiaee.2011.18202

202. **Beauchesne, J-F. & Makungwe, M.** 2022. *Creating opportunities for increasing youth employment in the agriculture sector. Internship report: Accelerating the Impact of the CGIAR's Research in Africa (AICCRA)-Zambia*. https://cgspace.cgiar.org/items/7a0117e6-43ca-4d77-8d38-422f49e7a8ce

203. **Fox, L. & Kaul, U.** 2018. *The evidence is in: How should youth employment programs in low-income countries be designed?* World Bank Policy Research Working Paper No. 8500. Washington, DC, Woorld Bank. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3238339

204. **UNESCO**. 2024. *Skillsets in transit: Understanding recognition, validation and accreditation of learning outcomes for migrants and refugees*. Paris, UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000392075.locale=en

205. **Kiprop, C., Kirwa, L., Ngotho, E., Mwungu, C., Wanjau, A., Otieno, F., Gamoyo, M. *et al.*** 2024. *Impact evaluation of shamba shape up weather and farming news on smallholder farmers in Kenya. Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) Impact Evaluation Technical Report.* https://cgspace.cgiar.org/server/api/core/bitstreams/e69168e9-26cf-4c66-b806-0702729538ff/content

206. **Gandhi, R., Veeraraghavan, R., Toyama, K. & Ramprasad, V.** 2007. *Digital Green: Participatory video for agricultural extension*. In: *2007 International Conference on Information and Communication Technologies and Development, 15–16 December 2007*. https://doi.org/10.1109/ICTD.2007.4937388

207. **Franzel, S., Lowicki-Zucca, J., Miiro, R. & Uwitonze, N.** 2020. Demand-driven extension and advisory services–catalysing opportunities for youth in agriculture. *Rural 21: International Journal for Rural Development*, 54(2): 23–25.

208. **Ullah, A., Adams, F. & Bavorova, M.** 2024. Empowering young farmers' voices in climate change extension programs: An in-depth analysis of decision-making dynamics and social media engagement. *International Journal of Disaster Risk Reduction*, 111: 104713.

209. **FAO, CTA (Technical Centre for Agricultural and Rural Cooperation) & IFAD, eds.** 2014. *Youth and agriculture: Key challenges and concrete solutions*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/408708f0-82dc-418e-b92b-e2d7ec0cd2e6/content

210. **Djeddah, C., Mavanga, R. & Hendrickx, L.** 2006. Junior farmer field and life schools: Experience from Mozambique. In: S. Gilespie, ed. *IDS, poverty, and hunger*. pp. 325–340. Washington, DC, International Food Policy Research Institute (IFPRI). https://cgspace.cgiar.org/server/api/core/bitstreams/337efed1-1489-4d4d-8462-f0663893cf50/content

211. **Minde, I., Terblanche, S., Bashaasha, B., Madakadze, I.C., Snyder, J. & Mugisha, A.** 2015. Challenges for agricultural education and training (AET) institutions in preparing growing student populations for productive careers in the agri-food system. *Journal of Agribusiness in Developing and Emerging Economies*, 5(2): 137–169. https://doi.org/10.1108/JADEE-02-2015-0011

212. **Lyons, T.S., Miller, S.R. & Mann, J.T.** 2018. A new role for land grant universities in the rural innovation ecosystem? *Journal of Regional Analysis and Policy*, 48(2): 32–47. www.researchgate.net/publication/326609725

213. **Beanstalk**. 2023. *State of the Digital Agriculture Sector in LMICs: Harnessing the Potential of Digital for Impact Across Agricultural Value Chains in Low- and Middle-Income Countries*. www.beanstalkagtech.com/d4aglmic

214. **World Bank, UNESCO & ILO**. 2023. *Building better formal TVET systems: Principles and practice in low- and middle-income countries*. Washington, DC/Paris/Geneva. https://documents1.worldbank.org/curated/en/099071123130516870/pdf/P175566037a5e20650a657068b5152205bf.pdf

215. **Arias, O., Evans, D.K. & Santos, I.** 2019. *The skills balancing act in Sub-Saharan Africa: Investing in skills for productivity, inclusivity, and adaptability*. Africa Development Forum series. Washington, DC, World Bank. https://documents1.worldbank.org/curated/en/558991560840574354/pdf/The-Skills-Balancing-Act-in-Sub-Saharan-Africa-Investing-in-Skills-for-Productivity-Inclusivity-and-Adaptability.pdf

216. **Woessmann, L.** 2019. Facing the life-cycle trade-off between vocational and general education in apprenticeship systems. An economics-of-education perspective. *Journal for Educational Research Online*, 11(1): 31–46. www.pedocs.de/volltexte/2019/16786/pdf/JERO_2019_1_Woessmann_Facing_the_life-cycle.pdf

217. **Hawkins, R.** 2021. *Agricultural Technical and Vocational Education and Training (ATVET) in Sub-Saharan Africa: Overview and integration within broader agricultural knowledge and innovation systems*. Wageningen, the Netherlands, iCRA Foundation. www.nlfoodpartnership.com/documents/112/ATVET_review_complete_26Feb21.pdf

218. **Ninson, J. & Brobbey, M.K.** 2023. "Review on engaging the youth in agribusiness". *Cogent Social Sciences*, 9(1): 2193480. https://doi.org/10.1080/23311886.2023.2193480

219. **McKenzie, D.** 2017. How effective are active labor market policies in developing countries? A critical review of recent evidence. *The World Bank Research Observer*, 32(2): 127–154. https://doi.org/10.1093/wbro/lkx001

220. **Karani, A.O., M. Waiganjo, M. & K. Mugambi, D.** 2024. The influence of Education 4.0 on decision-making and agripreneurship start-up behavior among agriculture students in Kenyan TVET institutions. *East African Journal of Education and Social Sciences*, 5(2): 1–13. https://doi.org/10.46606/eajess2024v05i02.0363

221. **Sulaiman, R. & Blum, M.** 2015. *Tailoring rural advisory services for family farms.* Rome, FAO & GFRAS. www.fao. org/3/i5704e/i5704e.pdf

222. **Christoplos, I.** 2010. *Mobilizing the potential of rural and agricultural extension.* Rome, FAO & GFRAS**Error! Hyperlink reference not valid.**

223. **Yang, P. & Ou, Y.** 2022. *Transforming public agricultural extension and advisory service systems in smallholder farming*. Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/cc2131en

224. **Suttie, D.** 2018. *Young people in a changing world: Youth and rural advisory services*. GFRAS Issues Paper 1. Switzerland, Global Forum of Rural Advisory Services (GFRAS).

225. **Kingiri, A.N.** 2021. Agricultural advisory and extension service approaches and inclusion in reaching out to Kenyan rural farmers. *African Journal of Science, Technology, Innovation and Development*, 13(7): 797–806. https://doi.org/10.1080/20421338.2020.1823098

226. **Aker, J.C., Ghosh, I. & Burrell, J.** 2016. The promise (and pitfalls) of ICT for agriculture initiatives. *Agricultural Economics*, 47(S1): 35–48. https://doi.org/10.1111/agec.12301

227. **Clark, J., Metz, A. & Casher, C.** 2021. *ID4D Global Dataset 2021, Volume 1: Global ID coverage estimates.* Washington, DC, World Bank. https://documents1.worldbank.org/curated/en/099705012232226786/pdf/P176341132c1ef0b21adf11abad304425ef.pdf

228. **Ozor, N.** 2013. The role of agribusiness innovation incubation for Africa's development. *African Journal of Science, Technology, Innovation and Development*, 5(3): 242–249. https://doi.org/10.1080/20421338.2013.796742

229. **Naeim, M.E.M., Scharweit, B. & Ho, H.** 2023. Rethinking agripreneurship: Impact of personal initiative agripreneurship training on improving the abilities of African youth to start and manage successful agribusinesses. Rome, FAO. https://openknowledge.fao.org/handle/20.500.14283/cc6557en

230. **Adeyanju, D., Mburu, J., Gituro, W., Chumo, C., Mignouna, D., Mulinganya, N. & Ashagidigbi, W.** 2023. Can young agripreneurs improve their skills through agripreneurship empowerment programmes? Evidence from Africa. *Heliyon*, 9(1): e12876. https://doi.org/10.1016/j.heliyon.2023.e12876

231. **World Bank**. 2022. *What works: Business incubators for rural youth*. Knowledge Brief Series Issue 17. Washington, DC. https://documents1.worldbank.org/curated/en/099644203152324047/pdf/IDU0e592cfc30028b04fcb0a9be0bf8bcc84f6a5.pdf

232. **Franzel, S., Davis, K.,Gammelgaard, J. & Preissing, J.** 2023. *Investing in young agripreneurs: Why and how?* Rome, FAO/International Food Policy Research Institute (IFPRI). https://doi.org/10.4060/cc2747en

233. **Aker, J.C.** 2011. Dial "A" for agriculture: A review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, 42(6): 631–647. https://doi.org/10.1111/j.1574-0862.2011.00545.x

234. **Baishya, S.K., Sangtam, H.M., Tungoe, M., Meyase, M., Tongoe, Z., Deka, B.C., Baishya, L.K. *et al.*** 2021. Empowering rural tribal youth through agripreneurship – evidence from a case study in North East India. *Current Science*, 120(12): 1854–1862. https://doi.org/10.18520/cs/v120/i12/1854-1862

235. **Bello, L.O., Baiyegunhi, L.J.S., Mignouna, D., Adeoti, R., Dontsop-Nguezet, P.M., Abdoulaye, T., Manyong, V. *et al.*** 2021. Impact of Youth-in-Agribusiness program on employment creation in Nigeria. *Sustainability*, 13(14): 7801. https://doi.org/10.3390/su13147801

236. **Bello, L.O., Baiyegunhi, L.J.S., Danso-Abbeam, G., Ogunniyi, A.I., Olagunju, K., Abdoulaye, T., Manyong, V. *et al.*** 2022. Assessing the Impact of Youth-in-Agribusiness program on poverty and vulnerability to poverty in Nigeria. *Agriculture*, 12(5): 735. https://doi.org/10.3390/agriculture12050735

237. **Blattman, C., Fiala, N. & Martinez, S.** 2013. Credit constraints, occupational choice, and the process of development: Long run evidence from cash transfers in Uganda. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2268552

238. **Melyoki, L.L.** 2022. Promoting youth employment through enterprise development: Lessons from the STRYDE intervention. *Business Management Review*, 24(1): S18–36. https://journals.udsm.ac.tz/index.php/bmr/article/download/4107/3657

239. **Olanrewaju, O., Osabohien, R. & Fasakin, J.** 2020. The Anchor Borrowers Programme and youth rice farmers in Northern Nigeria. *Agricultural Finance Review*, 81(2): 222–236. https://doi.org/10.1108/AFR-03-2020-0039241.

240. **Arévalo-Sánchez, I., Heisey, J., Chaudhary, S., Clay, T., Strokova, V., Vasudeva Dutta, P. & Andrews, C.** 2024. *The State of Economic Inclusion Report 2024: Pathways to scale*. Washington, DC, World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/4f94ee11-7ff7-48c5-954d-e8ad37083572/content

241. **Amare, M., Zavale, H., Smart, J. & Ghebru, H.** 2022. *The impact of market system development approaches: The case of InovAgro in Mozambique*. Washington, DC, International Food Policy Research Institute. https://hdl.handle.net/10568/140878

242. **Cassinath, N. & Mercer, M.** 2020. Youth, women, and market systems development in agriculture and supporting markets: Landscape analysis and case studies report. Rockville, MD, EnCompass LLC. https://beamexchange.org/media/filer_public/c7/fe/c7fea0a1-1119-4141-ac44-29e18c3cbc95/youth_women_and_msd_in_agriculture_and_supporting_markets.pdf

243. **CFS (Committee on World Food Security)**. 2021. *Promoting youth engagement and employment in agriculture and food systems*. HLPE report, 49th session "Making a Difference in Food and Nutrition". Rome. https://openknowledge.fao.org/items/25aad9ed-8f6a-4609-bcf3-f9d286e7543d

244. **Msangi, H.A., Waized, B., Ndyetabula, D.W. & Manyong, V.M.** 2024. Promoting youth engagement in agriculture through land titling programs: Evidence from Tanzania. *Heliyon*, 10(7): e29074. https://doi.org/10.1016/j.heliyon.2024.e29074

245. **Chazali, C., Ambarwati, A., Huijsmans, R. & White, B.** 2023. Young farmers' access to land: Gendered pathways into and out of farming in Nigara and Langkap (West Manggarai, Indonesia). In: S. Srinivasan, ed. *Becoming a young farmer: Young people's pathways into farming: Canada, China, India and Indonesia.* pp. 337–359. Cham, Switzerland, Springer International Publishing. https://library.oapen.org/bitstream/handle/20.500.12657/85035/978-3-031-15233-7.pdf?sequence=1#page=349

246. **Hambloch, C**. 2022. Land formalization turned land rush: The case of oil palm in Papua New Guinea. *Land Use Policy*, 112: 105818. https://doi.org/10.1016/j.landusepol.2021.105818

247. **Meinzen-Dick, R. & Mwangi, E**. 2009. Cutting the web of interests: Pitfalls of formalizing property rights. *Land Use Policy*, 26(1): 36–43. https://doi.org/10.1016/j.landusepol.2007.06.003

248. **Higgins, D., Balint, T., Liversage, H. & Winters, P.** 2018. Investigating the impacts of increased rural land tenure security: A systematic review of the evidence. *Journal of Rural Studies*, 61: 34–62. https://doi.org/10.1016/j.jrurstud.2018.05.001

249. **Ghebru, H. & Girmachew, F.** 2020. *Direct and spillover effects of land rights formalization in Africa A case study of the Second-Level Land Certification (SLLC) in Ethiopia*. IFPRI Discussion Paper 01968. Washington, DC, International Food Policy Research Institute. https://cgspace.cgiar.org/server/api/core/bitstreams/89996e1d-8b99-4ede-9560-793e8cb77f06/content

250. **Holden, S.T. & Tilahun, M.** 2021. Are land-poor youth accessing rented land? Evidence from Northern Ethiopia. *Land Use Policy*, 108: 105516. https://doi.org/10.1016/j.landusepol.2021.105516

251. **Żmija, K., Fortes, A., Tia, M.N., Šūmane, S., Ayambila, S.N., Żmija, D., Satoła, Ł. *et al.*** 2020. Small farming and generational renewal in the context of food security challenges. *Global Food Security*, 26: 100412.

252. **IFAD**. 2021. *How to do: Access to land for rural youth employment and entrepreneurship. Land tenure toolkit*. Rome. www.donorplatform.org/wp-content/uploads/2022/07/2021-IFAD-HTDN-youth-and-land-access.pdf

253. **White, B.** 2019. *Rural youth, today and tomorrow*. IFAD research series 48. Rome, IFAD. www.ifad.org/documents/d/new-ifad.org/08_white_2019-rdr-background-paper-pdf

254. **ILC (International Land Coalition)**. 2021. Youth access to land through redistributive policies and pro-youth quotas. In: *ILC Learning Hub*. Rome. [Cited 30 March 2025]. https://learn.landcoalition.org/es/blogs/youth-access-land-redistributive-policies-and-pro-youth-quota

255. **White, B.** 2020. *Agriculture and the generation problem*. Rugby, UK, Practical Action Publishing. https://practicalactionpublishing.com/book/45/download%3Ftype%3Ddownload.pdf

256. **Eco Ruralis.** 2016. *Farm succession in Romania: Who will take over the lands from an aging peasant population?* Cluj, Romania, Asociaţia Eco Ruralis. www.accesstoland.eu/IMG/pdf/farm_succession_report_eco_ruralis_en_web.pdf

257. **Liu, J., Fang, Y., Wang, G., Liu, B. & Wang, R.** 2023. The aging of farmers and its challenges for labor-intensive agriculture in China: A perspective on farmland transfer plans for farmers' retirement. *Journal of Rural Studies*, 100: 103013.

258. **United Nations**. 2020. Youth 2030: The UN Youth Strategy. In: *Office of the Secretary-General's Envoy on Youth*. New York, USA. [Cited 22 November 2024]. www.un.org/youthenvoy/youth-un

259. **FAO**. 2022. *Rural Youth Action Plan*. Rome. https://openknowledge.fao.org/handle/20.500.14283/cc0583en

260. **IFAD**. 2019. IFAD Action Plan – Rural Youth. In: *IFAD*. Rome. [Cited 22 November 2024]. www.ifad.org/en/w/corporate-documents/policies/ifad-action-plan-rural-youth

261. **USAID**. 2024. Youth in Development Policy. In: *US Agency for International Development*. Washington, DC. [Cited 22 November 2024]. www.usaid.gov/policy/youth

262. **African Union**. 2006. African Youth Charter. In: *African Union*. Addis Ababa. [Cited 22 November 2024]. https://au.int/en/treaties/african-youth-charter

263. **Council of Europe**. 2020. Our Youth Strategy. In: *Youth*. Strasbourg, France. [Cited 22 November 2024]. www.coe.int/en/web/youth/youth-strategy

264. **ICA (International Co-operative Alliance)**. 2021. *Young people and cooperatives: A perfect match? Global thematic research report*. Brussels. https://coops4dev.coop/sites/default/files/2021-03/Coops4devYoungPeopleReport.pdf

265. **ILO**. 2012. *A better future for young people: What cooperatives can offer*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/@ed_emp_msu/documents/publication/wcms_195535.pdf
266. **Vinci, I., Hani, M. & Djeddah, C.** 2016. *Local solutions to social protection – the role of rural organizations*. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/9715bc3e-f9c8-4c41-bf1e-fc66c59ac32b/content
267. **Awortwi, N.** 2018. Social protection is a grassroots reality: Making the case for policy reflections on community-based social protection actors and services in Africa. *Development Policy Review*, 36(S2). https://doi.org/10.1111/dpr.12364
268. **Goh, L.** 2022. How agritech is transforming traditional agriculture in emerging markets: "Think big, act fast, start small". In: H. Kharas, J.W. McArthur & I. Ohno, eds. *Breakthrough: The promise of frontier technologies for sustainable development*. pp. 125–148. Washington, DC. Brookings Institution Press. https://muse.jhu.edu/pub/11/edited_volume/chapter/3054461
269. **Singh, S. & Datta, N.** 2021. *Digital solutions for youth agripreneurs*. Washington, DC, World Bank Group. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/en/099529103152349556
270. **Benni, N., Berno, D. & Cungu, A.** 2022. *Promoting access to agricultural finance for youth in developing countries*. Rome, FAO. https://doi.org/10.4060/cc2868en
271. **Mastercard Foundation**. 2020. FinTech company aims to address challenges in ag economy. *Mastercard Foundation*,12 May 2020. https://mastercardfdn.org/en/articles/fintech-company-aims-to-address-challenges-in-ag-economy
272. **Heifer International**. 2022. ThriveAgric: Building Africa's largest network of productive, profitable farmers. In: *AYuTe Africa Challenge*. Little Rock, AR. [Cited 6 March 2025]. https://ayute.africa/champions/2023/thriveagric
273. **MIT**. 2023. ThriveAgric – agriculture operating system. *Solve*. Cambridge, MA. [Cited 6 March 2025]. https://solve.mit.edu/solutions/70957
274. **Trivelli, C. & Morel, J.** 2021. Rural youth inclusion, empowerment, and participation. *Journal of Development Studies*, 57(4): 635–649.
275. **United Nations**. 2023. *Our Common Agenda Policy Brief 3: Meaningful youth engagement in policymaking and decision-making processes*. New York, USA. www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-youth-engagement-en.pdf
276. **World Bank**. undated. The Living Standards Measurement Study (LSMS). The World Banks' Flagship Household Survey Program. In: *World Bank*. Washington, DC. [Cited 8 May 2025]. www.worldbank.org/en/programs/lsms
277. **United Nations**. undated. Youth. In: *Global Issues*. New York, USA. [Cited 7 May 2025]. www.un.org/en/global-issues/youth
278. **Porciello, J., Coggins, S., Otunda-Payne, G. & Mabaya, E.** 2021. *A Systematic scoping review: How are farmers using digital services in low- and middle-income countries?* Agriculture in the Digital Age. https://hdl.handle.net/1813/103771
279. **FAO**. 2024. Monitoring and Analysing Food and Agricultural Policies. In: *MAFAP*. [Cited 21 November 2024]. www.fao.org/in-action/mafap/en
280. **OECD**. 2024. *Agricultural Policy Monitoring and Evaluation 2024. Innovation for sustainable productivity growth*. Paris, OECD Publishing. www.oecd.org/en/publications/agricultural-policy-monitoring-and-evaluation-2024_74da57ed-en.html
281. **Kruger, M.J. & Nell, T.A.** 2017. Bone mineral density in people living with HIV: A narrative review of the literature. *AIDS Research and Therapy*, 14(1): 35. https://doi.org/10.1186/s12981-017-0162-y
282. **Neufeld, L., Pelletier, D.L. & Haas, J.D.** 1999. The timing of maternal weight gain during pregnancy and fetal growth. *American Journal of Human Biology*, 11(5): 627–637. https://doi.org/10.1002/(SICI)1520-6300(199909/10)11:5<627::AID-AJHB6>3.0.CO;2-X
283. **Neufeld, L.M., Andrade, E.B., Ballonoff Suleiman, A., Barker, M., Beal, T., Blum, L.S., Demmler, K.M. *et al.*** 2022. Food choice in transition: Adolescent autonomy, agency, and the food environment. *The Lancet*, 399(10320): 185–197. https://doi.org/10.1016/S0140-6736(21)01687-1
284. **FAO**. 2017. *Rural Africa in motion: Dynamics and drivers of migration south of the Sahara*. Rome, FAO & CIRAD. https://openknowledge.fao.org/handle/20.500.14283/i7951en
285. **Andersson Djurfeldt, A.** 2021. Translocal livelihoods research and the household in the Global South – a gendered perspective. *Journal of Rural Studies*, 86: 16–23. https://doi.org/10.1016/j.jrurstud.2021.05.018
286. **Mercandalli, S., Losch, B., Belebema, M.N., Bélières, J-F., Bourgeois, R., Dinbabo, M.F., Fréguin-Gresh, S. *et al.*** 2019. *Rural migration in sub-Saharan Africa: Patterns, drivers and relation to structural transformation*. Working Paper. Rome, FAO & CIRAD. https://openknowledge.fao.org/items/7e560d26-08c8-49a1-841b-054a9ef8c34e
287. **IOM**. 2022. Global guidance on bilateral labour migration agreements. In: *UN Network on Migration*. New York, USA. [Cited 27 March 2025]. https://migrationnetwork.un.org/resources/global-guidance-bilateral-labour-migration-agreements
288. **Tacoli, C., Agergaard, J., Andreasen, M.H. & Brown, D.** 2025. Introduction: Changing rural-urban linkages in the Global South. In: C. Tacoli, J. Agergaard, M.H. Andreasen & D. Brown, eds. *Handbook on rural-urban linkages in the Global South*. Cheltenham, UK, Edward Elgar Publishing. www.elgaronline.com/edcollchap/book/9781802207712/chapter1.xml
289. **Magbondé, K.G., Mignouna, D., Manyong, V., Adéoti, R. & Sossou, A.O.** 2023. Impact of informal institutions on youth agribusiness participation in Southern Benin. *Agricultural and Food Economics*, 11(1): 11. https://doi.org/10.1186/s40100-023-00250-1
290. **Yeboah, F.K., Jayne, T.S., Muyanga, M. & Chamberlin, J.** 2019. *Youth access to land, migration and employment opportunities: Evidence from sub-Saharan Africa*. IFAD Research Series 53. Rome, IFAD.
291. **Daum, T.** 2023. Mechanization and sustainable agri-food system transformation in the Global South. A review. *Agronomy for Sustainable Development*, 43(1): 16. https://doi.org/10.1007/s13593-023-00868-x
292. **FAO**. 2021. *Adoption of farm inputs, mechanization, irrigation and gender gaps in sub-Saharan Africa: Insights from the Rural Livelihoods Information System (RuLIS)*. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/23b81d6e-33e3-491d-85b9-b9675f8fbd83/content

BOXES AND SPOTLIGHTS

CHAPTER 1

BOX 1.1 | TRADE-OFFS IN AGRIFOOD SYSTEMS TRANSITIONS

i. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512
ii. **FAO**. 2024. *The State of Food and Agriculture 2024: Value-driven transformation of agrifood systems*. Rome. https://doi.org/10.4060/cd2616en
iii. **Béné, C., Frankenberger, T.R., Nelson, S., Constas, M.A., Collins, G., Langworthy, M. & Fox, K.** 2023. Food system resilience measurement: Principles, framework and caveats. *Food Security*, 15(6): 1437—1458. https://doi.org/10.1007/s12571-023-01407-y
iv. **Ambikapathi, R., Schneider, K.R., Davis, B., Herrero, M., Winters, P. & Fanzo, J.C.** 2022. Global food systems transitions have enabled affordable diets but had less favourable outcomes for nutrition, environmental health, inclusion and equity. *Nature Food*, 3(9): 764—779. https://doi.org/10.1038/s43016-022-00588-7

BOX 1.2 | YOUTH AGENCY

i. **DeJaeghere, J.G., McCleary, K.S. & Josić, J.** 2016. Conceptualizing youth agency. In: J.G. DeJaeghere, J. Josić & K.S. McCleary, eds. *Education and youth agency*. pp. 1—24. Advancing Responsible Adolescent Development. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-319-33344-1_1

ii. **Glover, D. & Sumberg, J.** 2020. Youth and food systems transformation. *Frontiers in Sustainable Food Systems*, 4. https://doi.org/10.3389/fsufs.2020.00101

iii. **White, B.** 2021. Human capital theory and the defectology of aspirations in policy research on rural youth. *The European Journal of Development Research*, 33(1): 54—70. https://doi.org/10.1057/s41287-020-00300-0

iv. **Honwana, A.** 2012. *The time of youth: Work, social change, and politics in Africa*. Boulder, CO, *Lynne Rienner Publishers* www.rienner.com/title/The_Time_of_Youth_Work_Social_Change_and_Politics_in_Africa

v. **Whitehead, K., Keshet, M., Lombrowski, B., Domenico, A. & Green, D.** 2007. Definition and accountability: A youth perspective. *American Journal of Orthopsychiatry*, 77(3): 348—349. https://doi.org/10.1037/0002-9432.77.3.348

vi. **Rao, N.** 2015. Transnational remittances and gendered status enhancement in rural Bangladesh. In: L.A. Hoang & B.S.A. Yeoh, eds. *Transnational labour migration, remittances and the changing family in Asia*. pp. 27—49. London, Palgrave Macmillan UK. https://doi.org/10.1057/9781137506863_2

vii. **Punch, S.** 2002. Youth transitions and interdependent adult–child relations in rural Bolivia. *Journal of Rural Studies*, 18(2): 123—133. https://doi.org/10.1016/S0743-0167(01)00034-1

viii. **Zimmerman, L.A., Li, M., Moreau, C., Wilopo, S. & Blum, R.** 2019. Measuring agency as a dimension of empowerment among young adolescents globally; findings from the Global Early Adolescent Study. *SSM — Population Health*, 8: 100454. https://doi.org/10.1016/j.ssmph.2019.100454

ix. **White, B.** 2012. Indonesian rural youth transitions: Employment, mobility and the future of agriculture. In: A. Booth & C. Manning, eds. *Land, livelihood, the economy, and the environment in Indonesia*. Jakarta, Yayasan Pustaka Obor.

SPOTLIGHT 1.1 | GENERATIONAL RENEWAL IN AGRICULTURE: CHALLENGES AND OPPORTUNITIES FOR DECLINING YOUTH POPULATIONS

i. **UNDESA.** 2024. World Population Prospects – 2024 Revision. United Nations. New York, USA. [Cited 7 August 2024]. https://population.un.org/wpp

ii. **Eurostat.** 2022. Farmers and the agricultural labour force – statistics. *European Union.* Brussels. [Cited 5 March 2025]. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Farmers_and_the_agricultural_labour_force_-_statistics

iii. **Bunyasiri, I., Suchato, R. & Sirisupluxana, P.** 2024. Adaptation of rice farmers to aging in Thailand. *Open Agriculture*, 9(1). https://doi.org/10.1515/opag-2022-0364

iv. **Ren, C., Zhou, X., Wang, C., Guo, Y., Diao, Y., Shen, S., Reis, S. *et al.*** 2023. Ageing threatens sustainability of smallholder farming in China. *Nature*, 616(7955): 96–103. https://doi.org/10.1038/s41586-023-05738-w

v. **Jansuwan, P. & Zander, K.K.** 2021. What to do with the farmland? Coping with ageing in rural Thailand. *Journal of Rural Studies*, 81: 37–46. https://doi.org/10.1016/j.jrurstud.2020.12.003

vi. **Coopmans, I., Dessein, J., Accatino, F., Antonioli, F., Gavrilescu, C., Gradziuk, P., Manevska-Tasevska, G. *et al.*** 2020. Policy directions to support generational renewal in European farming systems. *EuroChoices*, 19(2): 30–36. https://doi.org/10.1111/1746-692X.12282

vii. **Chiswell, H.M. & Lobley, M.** 2018. "It's definitely a good time to be a farmer": Understanding the changing dynamics of successor creation in late modern society. *Rural Sociology*, 83(3): 630–653. https://doi.org/10.1111/ruso.12205

viii. **Koczberski, G. & Curry, G.N.** 2017. Changing generational values and new masculinities amongst smallholder export cash crop producers in Papua New Guinea. In: A. Biersack & M. Macintyre, eds. *Emergent masculinities in the Pacific*. Abingdon-on-Thames, UK, Routledge.

ix. **Borda, Á.J., Sárvári, B. & Balogh, J.M. 2023.** Generation change in agriculture: A systematic review of the literature. Economies, 11(5): 129. https://doi.org/10.3390/economies11050129

x. **Brandth, B. & Overrein, G. 2013.** Resourcing children in a changing rural context: Fathering and farm succession in two generations of farmers. *Sociologia Ruralis*, 53(1): 95–111. https://doi.org/10.1111/soru.12003

xi. **Satoła, Ł.** 2019. Problems of the aging of the farmers' population in small farms in Poland. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and Rural Development"*, 19(4). https://managementjournal.usamv.ro/pdf/vol.19_4/Art41.pdf

xii. **Lorenzen, R.P.** 2015. Disintegration, formalisation or reinvention? Contemplating the future of Balinese irrigated rice societies. *The Asia Pacific Journal of Anthropology*, 16(2): 176–193. https://doi.org/10.1080/14442213.2014.1000953

xiii. **Lorenzen, R.P. & Lorenzen, S.** 2011. Changing realities–perspectives on Balinese rice cultivation. *Human Ecology*, 39(1): 29–42. https://doi.org/10.1007/s10745-010-9345-z

xiv. **Swindell, K.** 2019. Faith, work, farming and business: The role of the spiritual in West African livelihoods. *Journal of Asian and African Studies*, 54(6): 819–837. https://doi.org/10.1177/0021909619840754

xv. **Mohanty, B.B. & Lenka, P.K.** 2023. "For them farming may be the last resort, but for us it is a new hope": Ageing, youth and farming in India. *Journal of Agrarian Change*, 23(4): 771–791. https://doi.org/10.1111/joac.12538

xvi. **Ansell, N., Froerer, P., Huijsmans, R., Dungey, C., Dost, A. & Piti.** 2020. Educating "surplus population": Uses and abuses of aspiration in the rural peripheries of a globalising world. *Fennia – International Journal of Geography*, 198(1–2). https://doi.org/10.11143/fennia.90756

xvii. **White, B.** 2021. Human capital theory and the defectology of aspirations in policy research on rural youth. *The European Journal of Development Research*, 33(1): 54–70. https://doi.org/10.1057/s41287-020-00300-0

xviii. **Steward, A.** 2007. Nobody farms here anymore: Livelihood diversification in the Amazonian community of Carvão, a historical perspective. *Agriculture and Human Values*, 24(1): 75–92. https://doi.org/10.1007/s10460-006-9032-2

xix. **Downey, H., Threlkeld, G. & Warburton, J.** 2017. What is the role of place identity in older farming couples' retirement considerations? *Journal of Rural Studies*, 50: 1–11. https://doi.org/10.1016/j.jrurstud.2016.12.006

xx. **Mariwah, S., Evans, R. & Antwi, K.B.** 2019. Gendered and generational tensions in increased land commercialisation: Rural livelihood diversification, changing land use, and food security in Ghana's Brong-Ahafo region. *Geo: Geography and Environment*, 6(1): e00073. https://doi.org/10.1002/geo2.73

xxi. **Dhanya, P., Ramachandran, A. & Palanivelu, K.** 2022. Understanding the local perception, adaptation to climate change and resilience planning among the farmers of semi-arid tracks of South India. *Agricultural Research*, 11(2): 291–308. https://doi.org/10.1007/s40003-021-00560-0

xxii. **Conway, S.F., Farrell, M., McDonagh, J. & Kinsella, A., eds.** 2020. Mobilising land mobility in the European Union: An under-researched phenomenon. *International Journal of Agricultural Management*, 9: 7–11. https://doi.org/10.22004/ag.econ.329795

xxiii. **Ramos, G.** 2005. The continuity of family agriculture and the succession system: The Basque case. *Journal of Comparative Family Studies*, 36(3): 367–375. https://doi.org/10.3138/jcfs.36.3.367

xxiv. **Yamashita, R. & Morisawa, K.** 2020. Consideration of qualitative changes in agricultural settlements due to land consolidation. *International Review for Spatial Planning and Sustainable Development*, 8(1): 124–136. https://doi.org/10.14246/irspsda.8.1_124

xxv. **Zagata, L., Hrabák, J., Lošťák, M., Bavorová, M., Ratinger, T., Sutherland, L-A. & McKee, A.** 2017. *Research for AGRI Committee – Young farmers – Policy implementation after the 2013 CAP reform*. Brussels, Directorate General for Internal Policies, Policy Department B, Structural and Cohesion Policies. https://policycommons.net/artifacts/2055360/research-for-agri-committee/2808451

xxvi. **Eco Ruralis.** 2016. *Farm succession in Romania: Who will take over the lands from an aging peasant population?* Cluj, Romania, Asociaţia Eco Ruralis.

xxvii. **Liu, J., Fang, Y., Wang, G., Liu, B. & Wang, R.** 2023. The aging of farmers and its challenges for labor-intensive agriculture in China: A perspective on farmland transfer plans for farmers' retirement. *Journal of Rural Studies*, 100: 103013.

xxviii. **Rigg, J., Salamanca, A. & Thompson, E.C.** 2016. The puzzle of East and Southeast Asia's persistent smallholder. *Journal of Rural Studies*, 43: 118–133. https://doi.org/10.1016/j.jrurstud.2015.11.003

xxix. **Heider, K., Rodriguez Lopez, J.M., Balbo, A.L. & Scheffran, J.** 2021. The state of agricultural landscapes in the Mediterranean: Smallholder agriculture and land abandonment in terraced landscapes of the Ricote Valley, southeast Spain. *Regional Environmental Change*, 21(1): 23. https://doi.org/10.1007/s10113-020-01739-x

CHAPTER 2

BOX 2.1 | FORCED DISPLACEMENT

i. **UNHCR**. 2024. *Global trends: Forced displacement in 2023*. Geneva.

ii. **IDMC.** 2022. *Global Report on Internal Displacement 2022. Children and youth in internal displacement*. Geneva, Internal Displacement Monitoring Centre. https://api.internal-displacement.org/sites/default/files/publications/documents/IDMC_GRID_2022_LR.pdf

iii. **Cazabat, C.** 2019. *Becoming an adult in internal displacement: Key figures, challenges, and opportunities for internally displaced youth*. Geneva, Internal Displacement Monitoring Centre.

BOX 2.2 | YOUTH MIGRATION TO EUROPE — MIGRANT CHARACTERISTICS AND KEY MIGRATION DETERMINANTS

BOX 2.3 | SPATIAL PATTERNS OF YOUTH MIGRATION IN WEST AND EAST AFRICA

i. **Ingelaere, B., Christiaensen, L., De Weerdt, J. & Kanbur, R.** 2018. Why secondary towns can be important for poverty reduction – a migrant perspective. *World Development*, 105:273–282. doi:10.1016/j.worlddev.2017.12.025

ii. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban-rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences of the United States of America*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118

iii. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. *In: FAO Agro-informatics Data Catalog Portal*: *Global Urban Rural Catchment Areas (URCA) Grid – 2021*. [Cited 11 July 2023]. https://data.apps.fao.org/catalog/iso/9dc31512-a438-4b59-acfd-72830fbd6943

iv. **FAO**. 2018. *The State of Food and Agriculture 2018. Migration, agriculture and rural development*. Rome, FAO.

v. **Young, A.** 2013. Inequality, the urban-rural gap, and migration. *The Quarterly Journal of Economics*, 128(4): 1727–1785.

vi. **Mueller, V. & Lee, H.L.** 2019. Can migration be a conduit for transformative youth employment? In: V. Mueller & J. Thurlow, eds. *Youth and jobs in Rural Africa: Beyond stylized facts*. Oxford University Press. https://doi.org/10.1093/oso/9780198848059.003.0002

vii. **Becerra-Valbuena, L.G. & Millock, K.** 2021. Gendered migration responses to drought in Malawi. *Journal of Demographic Economics*, 87(3): 437–477. https://doi.org/10.1017/dem.2021.8;

viii. **Dillon, A., Mueller, V. & Salau, S.** 2011. Migratory responses to agricultural risk in Northern Nigeria. *American Journal of Agricultural Economics*, 93(4): 1048–1061. https://doi.org/10.1093/ajae/aar033;

ix. **Gray, C. & Mueller, V.** 2012. Drought and population mobility in rural Ethiopia. *World Development*, 40(1): 134–145. https://doi.org/10.1016/j.worlddev.2011.05.023

BOX 2.4 | YOUTH TEMPORARY AND SEASONAL MIGRATION

i. **Martin-Gutierrez, S., Borondo, J., Morales, A.J., Losada, J.C., Tarquis, A.M. & Benito, R.M.** 2016. Agricultural activity shapes the mobility patterns in Senegal. Conference presentation at 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), August 2016. https://doi.org/10.1109/ASONAM.2016.7752303

ii. **Gubert, F. & Blanchard, P.** 2024. Temporary migration response to rainy season conditions in Senegal: New evidence using mobile phone data. *LISER,* Policy Brief 02. https://liser.elsevierpure.com/fr/publications/temporary-migration-response-to-rainy-season-conditions-in-senega

iii. **Delaunay, V., Engeli, E., Franzetti, R., Golay, G., Moullet, A. & Sauvain-Dugerdil, C.** 2016. La migration temporaire des jeunes au Sénégal [Temporary migration of young people to Senegal]. *Afrique contemporaine*, 259(3): 75–94.

iv. **Keshri, K. & Bhagat, R.B.** 2010. Temporary and seasonal migration in India. *Genus*, 66(3): 25–45.

v. **Banerjee, A.V. & Duflo, E.** 2007. The economic lives of the poor. *Journal of Economic Perspectives*, 21(1): 141–167.

vi. **Parida, J.K. & Madheswaran, S.** 2011. *Determinants of migration and remittance in India: Empirical evidence*. Bengaluru, India, Institute for Social and Economic Change. http://203.200.22.244/WP%20272%20-%20Jajati%20Keshari%20Parida_2.pdf

vii. **Dagbeto, G.S., Ndiga, B. & Muiruri, Z.K.** 2024. Seasonal migration and youth social life in the Eastern Barienou district, Benin. *International Journal of Science and Research Archive*, 13(1): 2636–2647.

viii. **de Menezes, M. A., da Silva, M. S. & Cover, M.** 2012. Migrant workers in sugarcane mills: A study of social networks and recruitment intermediaries in Brazil. *Agrarian South: Journal of Political Economy*, 1(2): 161–180.

ix. **Bardomás, S.M.** 2012. La migración estacional a producciones agrarias de un área de Argentina: el Valle de Uco, provincia de Mendoza [Seasonal migration to agricultural production in an area of Argentina: The Uco Valley, Mendoza province]. *Papeles de población*, 18(72): 39–62.

x. **Martin, P.L.** 2016. *Migrant workers in commercial agriculture.* Geneva, ILO.

xi. **Tacoli, C. & Mabala, R.** 2010. Exploring mobility and migration in the context of rural–urban linkages: Why gender and generation matter. *Environment and Urbanization,* 22(2): 389–395. https://doi.org/10.1177/0956247810379935

xii. **Berckmoes, L. & White, B.** 2014. Youth, farming and precarity in rural Burundi. *European Journal of Development Research,* 26 (2): 190–203. https://doi.org/10.1057/978-1-137-55623-3_13

xiii. **Bonnassieux, A. & Gangneron, F.** 2017. The role of seasonal and pluri-annual migration in reducing vulnerability : Hombori and Djougou districts. In: B. Sultan, R. Lalou, M.A. Sanni, A. Oumarou & M. Arame Soumaré, eds. *Rural societies in the face of climatic and environmental changes in West Africa*. pp. 253–268. Marseille, France, IRD Éditions. https://doi.org/10.4000/books.irdeditions.12367

xiv. **Asefawu, G.S.** 2022. Seasonal migration and household food security status in the drought-prone areas of Northeast Ethiopia. *Environmental Challenges*, 8: 100566. https://doi.org/10.1016/j.envc.2022.100566

xv. **FAO.** 2023. *Gender roles related to work burden and child labour in agriculture in Punjab*. Islamabad. Gender roles related work burden and child labour in agriculture in Punjab

xvi. **FAO**. 2021. *Seasonal migration and child labour in agriculture: Background paper.* Rome. https://openknowledge.fao.org/handle/20.500.14283/CB7360EN

xvii. **Sauvain-Dugerdil, C.** 2013. Youth mobility in an isolated Sahelian population of Mali. *The ANNALS of the American Academy of Political and Social Science*, 648(1): 160–174. https://doi.org/10.1177/0002716213485352

xviii. **Zuccotti, C.V., Geddes, A., Bacchi, A., Nori, M. & Stojanov, R.** 2018. *Drivers and patterns of rural youth migration and its impact on food security and rural livelihoods in Tunisia*. Rome, FAO; Florence, Italy, Migration Policy Centre. https://cadmus.eui.eu/handle/1814/53724

CHAPTER 3

BOX 3.1 | YOUTH REPRESENTATION IN FORMAL POLITICAL PROCESSES

i. **Inter-Parliamentary Union**. 2024. Youth participation in national parliaments: 2023. In: *Inter-Parliamentary Union*. Geneva. [Cited 15 November 2024]. www.ipu.org/resources/publications/reports/2023-10/youth-participation-in-national-parliaments-2023

ii. **Akram-Lodhi, A.H. & Huijsmans, R.** 2024. Conclusion: Youth aspirations, trajectories, and farming futures. In: S. Srinivasan, ed. *Becoming a young farmer: Young people's pathways into farming: Canada, China, India and Indonesia*. pp. 415–433. Cham, Switzerland, Springer International Publishing. https://doi.org/10.1007/978-3-031-15233-7_15

iii. **Augsberger, A., Collins, M.E., Gecker, W. & Dougher, M.** 2018. Youth civic engagement: Do youth councils reduce or reinforce social inequality? *Journal of Adolescent Research*, 33(2): 187–208. https://doi.org/10.1177/0743558416684957

iv. **Daum, T.** 2019. Of bulls and bulbs: Aspirations, opinions and perceptions of rural adolescents and youth in Zambia. *Development in Practice*, 29(7): 882–897. https://doi.org/10.1080/09614524.2019.1646209

v. **Elias, M., Mudege, N.N., Lopez, D.E., Najjar, D., Kandiwa, V., Luis, J.S., Yila, J. *et al.*** 2018. Gendered aspirations and occupations among rural youth, in agriculture and beyond: A cross-regional perspective. *Journal of Gender, Agriculture and Food Security*. https://cgspace.cgiar.org/bitstream/10568/99065/1/Gendered_Elias_2018.pdf

vi. **IFAD.** 2019. 2019 Rural Development Report: Creating opportunities for rural youth. Rome. www.ifad.org/ruraldevelopmentreport

vii. **Mohamed, F.A.E.** 2011. The determinants of political participation of rural youth: A comparative study between male and female youth in Menoufiya Governorate. *Arab Universities Journal of Agricultural Sciences*, 19(1): 39–85. https://doi.org/10.21608/ajs.2011.14522

viii. **The Body Shop & United Nations Office of the Secretary-General's Envoy on Youth.** 2022. *Be Seen Be Heard Global Youth Report*. New York, USA. https://futuranetwork.eu/public/oltreil2030/files/Documenti_news/UN_REPORT_TBS_ACCESSIBLE.16c38f81bbe6646c5daf.pdf

ix. **CIRCLE**. 2024. Lack of civic support for rural youth may lead to lower civic engagement. *CIRCLE*. Medford, MA. [Cited 3 April 2025]. https://circle.tufts.edu/latest-research/lack-civic-support-rural-youth-may-lead-lower-civic-engagement

x. **Kari, A.G.U., Mshelia, I.H. & Badmus, B.A.** 2024. Prioritising rural youth participation in democratic governance for sustainable development in Nigeria. *European Economic Letters (EEL)*, 14(2): 3045–3053.

xi. **Oosterom, M**. 2018. Youth engagement in the realm of local governance: Opportunities for peace? [Cited 11 December 2024]. www.ids.ac.uk/publications/youth-engagement-in-the-realm-of-local-governance-opportunities-for-peace

BOX 3.2 | EDUCATION AND TRAINING OF YOUNG MIGRANTS, REFUGEES AND INTERNALLY DISPLACED PERSONS (IDPS)

i. **De Haas, H.** 2021. A theory of migration: The aspirations-capabilities framework. *Comparative Migration Studies*, 9(1): 8.

ii. **OECD**. 2018. *The resilience of students with an immigrant background: Factors that shape well-being*. OECD Reviews of Migrant Education. Paris, OECD Publishing. https://doi.org/10.1787/9789264292093-en

iii. **Miller, K.** 2016. Education across borders: The relationship between age at migration and educational attainment for Mexico-US child migrants. *Teachers College Record*, 118(1): 1–48.

iv. **Azizi, S.** 2018. The impacts of workers' remittances on human capital and labor supply in developing countries. *Economic Modelling*, 75: 377–396. https://doi.org/10.1016/j.econmod.2018.07.011

v. **Zhao, F. & Yu, G.** 2016. Parental migration and rural left-behind children's mental health in China: A meta-analysis based on mental health test. *Journal of Child and Family Studies*, 25(12): 3462–3472. https://doi.org/10.1007/s10826-016-0517-3

vi. **Fellmeth, G., Rose-Clarke, K., Zhao, C., Busert, L.K., Zheng, Y., Massazza, A., Sonmez, H. *et al.*** 2018. Health impacts of parental migration on left-behind children and adolescents: a systematic review and meta-analysis. *The Lancet*, 392(10164): 2567–2582. www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)32558-3/fulltext

vii. **UNHCR (United Nations High Commissioner for Refugees)**. 2025. Refugee data finder. *UNHCR*. Geneva. [Cited 22 March 2025]. www.unhcr.org/refugee-statistics

viii. **UNHCR**. 2023. *Unlocking potential: The right to education and opportunity*. New York, USA. www.unhcr.org/media/unhcr-education-report-2023-unlocking-potential-right-education-and-opportunity

BOX 3.3 | YOUTH-HEADED HOUSEHOLDS

i. **Chacaltana Janampa, J., Elder, S. & Lee, M.** 2019. *Youth transitions and lifetime trajectory.* ILO Working Paper No. 253, Geneva, ILO. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40ifp_skills/documents/publication/wcms_734499.pdf

ii. **Boris N.W., Brown L.A., Thurman T.R., Rice, J.C., Snider, L.M., Ntaganira, J. & Nyirazinyoye, L.N.** 2008. Depressive symptoms in youth heads of household in Rwanda: Correlates and implications for intervention. *Archives of Pediatrics and Adolescent Medicine*, 162(9): 836–843. https://jamanetwork.com/journals/jamapediatrics/fullarticle/380131

iii. **Thurman, T.R., Snider, L.A., Boris, N.W., Kalisa, E., Nyirazinyoye, L. & Brown, L.** 2008. Barriers to the community support of orphans and vulnerable youth in Rwanda. *Social Science & Medicine*, 66(7): 1557–1567. https://doi.org/10.1016/j.socscimed.2007.12.001

iv. **Ntuli, B., Sebola, E. & Madiba, S.** 2020. Responding to maternal loss: A phenomenological study of older orphans in youth-headed households in impoverished areas of South Africa. *Healthcare*, 8(3): 259. https://doi.org/10.3390/healthcare8030259

v. **Maila, K.S. & Mabasa, L.T.** 2023. Exploring the school-based support for youths who head households in Limpopo Province, South Africa. *Youth & Society*, 55(3): 399–419. https://doi.org/10.1177/0044118X21105667

vi. **Couter, T.R., Matsipane, M.J. & Bam, E.N.** 2024. Challenges faced by HIV/AIDS-orphaned youth in household headship: A qualitative study in Ngaka Modiri Molema, North West Province. https://doi.org/10.21203/rs.3.rs-5440403/v1

vii. **Kidido, J.K. & Lengoiboni, M.** 2019. Household land allocations and the youth land access nexus: Evidence from the Techiman Area of Ghana. *Land*, 8(12): 185. https://doi.org/10.3390/land8120185

viii. **Aragaw, F.M., Teklu, R.E., Belay, D.G., Negash, W.D., Fetene, S.M., Alemu, T.G., Eshetu, H.B. *et al.*** 2023. Individual and community level predictors of women's autonomy in health care decision-making among youth in East African countries: A multilevel analysis. *BMJ open*, 13(6): e066975. https://bmjopen.bmj.com/content/13/6/e066975

SPOTLIGHT 3.1 | AGRI-DIGITAL FINANCIAL SERVICES FOR YOUNG FARMERS AND AGRIPRENEURS

i. **Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. & Hess, J.R.** 2017. *The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution.* Washington, DC, World Bank https://documents1.worldbank.org/curated/en/332881525873182837/pdf/126033-PUB-PUBLIC-pubdate-4-19-2018.pdf

ii. **UNCDF**. 2017. *Demand-side research for youth financial services in the Gambia*. New York, USA. www.uncdf.org/article/3766/youth-financial-services-in-the-gambia

iii. **Aligishiev, Z. & Gravesteijn, R.** 2020. *Youth entrepreneurs engaging in the digital economy: The next generation*. New York, USA, UNDP, UNCDF. www.undp.org/publications/youth-entrepreneurs-engaging-digital-economy-next-generation

iv. **Anderson, J., Karuppusamy, R., Enrico Neumann, P. & Thangavel, V.** 2018. *High-saving youth in smallholder households: An untapped market*. Policy Brief. Washington, DC, CGAP. www.cgap.org/research/publication/high-saving-youth-in-smallholder-households-untapped-market

v. **Demirgüç-Kunt, A., Klapper, L., Singer, D. & Ansar, S.** 2022. *The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. Wshington, DC, World Bank. https://doi.org/10.1596/978-1-4648-1897-4

vi. **Phatty-Jobe, A.** 2020. *Digital agriculture maps*. GSMA AgriTech Programme. London, GSMA. www.gsma.com/r/digital-agriculture-maps

vii. **CGAP**. 2019. Infographic: High-saving youth in smallholder households. In: *CGAP*. London. www.cgap.org/research/infographic/infographic-high-saving-youth-in-smallholder-households

viii. **Barooah, B., Kaushish, B., Puri, J. & Leach, B.** 2017. *Understanding financial agricultural risk for smallholder farmers in developing countries. What do we know and not know?* Evidence Gap Map Report 9. Washington, DC, International Initiative for Impact Evaluation (3ie). https://3ieimpact.org/sites/default/files/2018-02/egm9-ag-risk.pdf

ix. **Shakhovskoy, M., Pshenichnaya, N., Lozano, M., Robertson, M. & Pulvermacher, K.** 2022. *State of the sector: Agri-insurance for smallholder farmers. A global stocktake of an evolving industry*. ISF advisors, Microinsurance Network. https://isfadvisors.org/state-of-the-sector-agri-insurance-for-smallholder-farmers

x. **Solve.** 2023. ThriveAgric – Agriculture Operating System. In: *MIT Solve*. Cambridge, MA. [Cited 7 March 2025]. https://solve.mit.edu/solutions/70957

xi. **Engström, E., Gupta, T., Burgaz, C., Hegwood, M., Hidayah, I., Shaikh, A.M., Iheme, G. *et al.*** 2024. *Digital technologies for multidimensional youth engagement in agrifood systems transformation*. Rome, FAO & WFF. https://openknowledge.fao.org/handle/20.500.14283/cd2715en

xii. **ThriveAgic**. 2023. *Breaking the barriers*. Impact Report. Abuja, Nigeria. https://thriveagric.com/resources/hectare/breaking-the-barriers-our-2023-impact-story

xiii. **Ayute Africa**. 2022. ThriveAgric: Building Africa's largest network of productive, profitable farmers. In: *AYuTe Africa Challenge*. Abuja, Nigeria. [Cited 6 March 2025]. https://ayute.africa/champions/2023/thriveagric

xiv. **Buchenau, J., Benni, N. & Cungu, A.** 2024. *Enabling markets of financial services for the rural youth*. Rome, Italy; Bonn, Germany, FAO, GIZ. https://doi.org/10.4060/cd3509en

xv. **Safaricom**. 2024. *Accelerating digital inclusion*. Sustainable Business Report. Nairobi. www.safaricom.co.ke/sustainabilityreport_2024

xvi. **Kioko, L.** 2019. Youth in agriculture: A new generation leverages technology. *Mercy Corps*, 23 July 2019. [Cited 7 March 2025]. https://mercycorpsagrifin.org/youth-in-agriculture-a-new-generation-leverages-technology

xvii. **Benni, N., Berno, D. & Cungu, A.** 2022. *Promoting access to agricultural finance for youth in developing countries*. Rome, FAO. https://doi.org/10.4060/cc2868en

xviii. **Duc, T.T.V.** 2025. Key players in Indonesia's agritech map falter as funding falls. In: *Tech in Aisa*. [Cited 7 March 2025]. www.techinasia.com/visual-story/key-players-indonesias-agritech-map-falter-funding-falls

xix. **Glavanits, J. & Szabo, T.** 2024. *FinTech solutions supporting sustainable agriculture. Lessons from Africa*. In: *Proceedings of the Central and Eastern European eDem and eGov Days 2024*. CEEeGov '24, New York, Association for Computing Machinery, 12 September 2024. https://doi.org/10.1145/3670243.3672435

SPOTLIGHT 3.2 | YOUTH WITH DISABILITIES

i. **United Nations.** 2006. *Convention on the Rights of Persons with Disabilities*, Article 1. Adopted 12 December 2006 by the Sixty-first session of the General Assembly by resolution A/RES/61/106. New York, USA. www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities

ii. **Ebuenyi, I.D., Regeer, B. J., Nthenge, M., Nardodkar, R., Waltz, M. & Bunders-Aelen, J.F**. 2019. Legal and policy provisions for reasonable accommodation in employment of persons with mental disability in East Africa: A review. *International Journal of Law and Psychiatry*, 64: 99–105. https://doi.org/10.1016/j.ijlp.2019.02.007

iii. **Manderson, L.** June 2004. Disability, global legislation and human rights. *Development*, 47(2): 35. http://dx.doi.org/10.1057/palgrave.development.1100027

iv. **Banks, L.M., Kuper, H. & Polack, S.** 2017. Poverty and disability in low- and middle-income countries: A systematic review. *PLoS One*, 12(12):e0189996. https://doi.org/10.1371/journal.pone.0189996

v. **Mailhot Amborski, A., Bussières, E.L., Vaillancourt-Morel, M.P. & Joyal, C.C.** 2022. Sexual violence against persons with disabilities: A meta-analysis. *Trauma Violence Abuse*, 23(4):1330–1343. https://doi.org/10.1177/15248380219959

vi. **UNDESA.** 2024. *Disability and Development Report 2024: Accelerating the realization of the Sustainable Development Goals by, for and with persons with disabilities*. New York, USA. https://social.desa.un.org/publications/un-flagship-report-on-disability-and-development-2024

vii. **Coleman-Jensen, A., Rabbitt, M.P., Gregory, C.A. & Singh, A.** 2017. *Household food security in the United States in 2017*. Economic Research Report 256. Washington, DC, USDA. https://ers.usda.gov/sites/default/files/_laserfiche/publications/90023/ERR-256.pdf?v=24059

viii. **Stott, G.N., Taetzsch, A. & Morrell, J.S.** 2023. College students with disabilities report higher rates of food insecurity. *Disability and Health Journal*, 16(4):101485. https://doi.org/10.1016/j.dhjo.2023.101485

ix. **Swenor, B.K.** 2021. Disability inclusion: A missing ingredient for food system equity. *Global Food Security*, 31: 100584. https://doi.org/10.1016/j.gfs.2021.100584

x. **Kuper, H., Hameed, S., Reichenberger, V., Scherer, N., Wilbur, J., Zuurmond, M., Mactaggart, I. *et al.*** 2021. Participatory research in disability in low-and middle-income countries: What have we learnt and what should we do*? Scandinavian Journal of Disability Research*, 23(1): 328–337. https://doi.org/10.16993/sjdr.814

xi. **WHO**. 2022. *Global report on health equity for persons with disabilities*. Geneva. www.who.int/health-topics/disability

xii. **UNDESA**. 2011. Fact Sheet: Youth with disabilities. New York, USA. https://social.un.org/youthyear/docs/Fact%20sheet%20youth%20with%20disabilities.pdf

xiii. **UNESCO & UNESCO Institute for Statistics**. 2018. *Education and disability: Analysis of data from 49 countries*. Information Paper 49. Paris, UNESCO Publishing. https://uis.unesco.org/sites/default/files/documents/ip49-education-disability-2018-en.pdf

xiv. **UNDESA. n.d.** Youth with disabilities. New York, USA. www.un.org/development/desa/youth/youth-with-disabilities.html#:~:text=Estimates%20suggest%20that%20there%20are,or%20her%20family%20and%20community

xv. **Chappell, P. & Lorenzo, T.** 2012. Exploring capacity for disability-inclusive development. In T. Lorenzo, ed. *Marrying community development and rehabilitation: Reality or aspiration for disabled people*. Disability Catalyst Africa Series 2. pp. 5–35. Cape Town, Megadigital.

CHAPTER 4

BOX 4.1 | YOUTH EMPLOYMENT AND WORK IN AGRIFOOD SYSTEMS: METHODOLOGICAL CONSIDERATIONS AND DATA

i. **ILO.** 2013. *Report I. General report: 19th International Conference of Labour Statisticians, Geneva, 2–11 October 2013*. https://tinyurl.com/adu9sxjp

ii. **Davis, B., Mane, E., Gurbuzer, L.Y., Caivano, G., Piedrahita, N., Schneider, K., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series. Rome. www.fao.org/documents/card/en/c/cc4337en

iii. **FAO**. 2023. *The Status of Women in Agrifood Systems*. Rome. https://doi.org/10.4060/cc5343en

iv. **Kafle, K., Paliwal, N. & Benfica, R.** 2024. Do youth work in agriculture? Short-term dynamics of on-farm rural youth employment in Tanzania and Malawi. *The Journal of Development Studies*: 1–28. https://doi.org/10.1080/00220388.2024.2420019

v. **FAO**. 2024.*The State of Food and Agriculture 2024*. Rome. https://openknowledge.fao.org/handle/20.500.14283/cd2616en

vi. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems* 5. https://doi.org/10.3389/fsufs.2021.746512

vii. **ILO**. 2023. ILO estimates based on ILO modelled estimates, November 2023.

viii. **ILO**.ILO Harmonized Microdata, https://ilostat.ilo.org/.

BOX 4.2. | GENDER PAY GAPS AMONG YOUTH

i. **de Brauw, A., Kramer, B. & Murphy, M.** 2021. Migration, labor and women's empowerment: Evidence from an agricultural value chain in Bangladesh. *World Development*, 142: 105445. https://doi.org/10.1016/j.worlddev.2021.105445

ii. **Kruijssen, F., McDougall, C.L. & van Asseldonk, I.J.M.** 2018. Gender and aquaculture value chains: A review of key issues and implications for research. *Aquaculture*, 493: 328–337. https://doi.org/10.1016/j.aquaculture.2017.12.038

iii. **FAO**. 2023. *The status of women in agrifood systems*. Rome. https://doi.org/10.4060/cc5343en

iv. **Benali, M., Slavchevska, V., Piedrahita, N., Davis, B., Sitko, N., Azzarri, C., Le, D.T. & Kluth, J.**. 2025. The agrifood-system wage gap and structural transformation: Cross country evidence. *Global Food Security, 46: 100851*. https://doi.org/10.1016/j.gfs.2025.100851

v. **Fabry, A., Van den Broeck, G. & Maertens, M.** 2022. Decent work in global food value chains: Evidence from Senegal. *World Development*, 152: 105790. https://doi.org/10.1016/j.worlddev.2021.105790

vi. **Mahajan, K.** 2017. Rainfall shocks and the gender wage gap: Evidence from Indian Agriculture. *World Development*, 91: 156–172. https://doi.org/10.1016/j.worlddev.2016.11.004

vii. **Fisher, M., Lewin, P.A. & Pilgeram, R.** 2022. Farmworkers and the gender wage gap: An empirical analysis of wage inequality in US agriculture. *Applied Economic Perspectives and Policy*, 44(4): 2145–2163. https://doi.org/10.1002/aepp.13202

viii. **Van den Broeck, G., Kilic, T. & Pieters, J.** 2023. Structural transformation and the gender pay gap in Sub-Saharan Africa. *PLOS ONE*, 18(4): 1–17. https://doi.org/10.1371/journal.pone.0278188

ix. **Hertz, T., Winters, P., Quiñones, E.J., Davis, B. & Zezza, A.** 2008. *Wage Inequality in International Perspective: Effects of Location, Sector, and Gender*. ESA Working Paper. No. 08-08. Rome, FAO.

x. **Oaxaca, R.** 1973. Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3): 693–709. https://doi.org/10.2307/2525981

xi. **Blinder, A.S.** 1973. Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, 8(4): 436–455. https://doi.org/10.2307/144855

xii. **Kitagawa, E.M.** 1955. Components of a difference between two rates*. *Journal of the American Statistical Association*, 50(272): 1168–1194. https://doi.org/10.1080/01621459.1955.10501299

xiii. **Brooks, K., Zorya, S., Gautam, A. & Goyal, A.** 2013. *Agriculture as a Sector of Opportunity for Young People in Africa*. Policy Research Working Papers. Washington, DC, World Bank. https://doi.org/10.1596/1813-9450-6473

BOX 4.3 | GAPS IN WORK-RELATED SOCIAL INSURANCE AND BENEFITS

i. **ILO.** 2013. *Decent work indicators. Guidelines for producers and users of statistical and legal framework indicators*. Geneva.

ii. **Desai, R.M. & Rudra, N. 2019.** Trade, poverty, and social protection in developing countries. *European Journal of Political Economy* 60 (1 December 2019): 101744. https://doi.org/10.1016/j.ejpoleco.2018.08.008

iii. **Mabiso, A. & Benfica, R.** 2019. The narrative on rural youth and economic opportunities in Africa: Facts, myths and gaps. *IFAD Research Series* 61(2019): 78.

SPOTLIGHT 4.1 | IN LOW- AND LOWER-MIDDLE-INCOME COUNTRIES, YOUTH ENGAGEMENT IN AGRIFOOD SYSTEMS DEPENDS ON THE SPACES IN WHICH THEY LIVE

i. **Hazell, P., Haggblade, S. & Reardon, T.** 2024. Transformation of the rural nonfarm economy during rapid urbanization and structural transformation in developing regions. *Annual Review of Resource Economics*. https://doi.org/10.1146/annurev-resource-101623-105713

ii. **Reardon, T., Tschirley, D., Minten, B., Haggblade, S., Liverpool-Tasie, L.S., Dolislager, M., Snyder, J. *et al.*** 2015. Transformation of African agrifood systems in the new era of rapid urbanization and the emergence of a middle class. In: O. Badiane & T. Makombe, eds. *Beyond a middle income Africa: Transforming African economies for sustained growth with rising employment and incomes*. ReSAKSS Annual Trends and Outlook Report 2014. Washington, DC, International Food Policy Research Institute.

iii. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118

iv. **Cattaneo, A., Adukia, A., Brown, D.L., Christiaensen, L., Evans, D.K., Haakenstad, A., McMenomy, T. *et al.*** 2022. Economic and social development along the urban–rural continuum: New opportunities to inform policy. *World Development*, 157: 105941. https://doi.org/10.1016/j.worlddev.2022.105941

v. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. Proceedings *of the National Academy of Sciences*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118

vi. **Abay, K.A., Asnake, W., Ayalew, H., Chamberlin, J. & Sumberg, J.** 2020. Landscapes of opportunity: patterns of young people's engagement with the rural economy in sub-Saharan Africa. *The Journal of Development Studies*: 1–20. https://doi.org/10.1080/00220388.2020.1808195

vii. **Arslan, A., Tschirley, D.L. & Egger, E-M.** 2021. Rural youth welfare along the rural-urban gradient: An empirical analysis across the developing world. *The Journal of Development Studies*, 57(4): 544–570.

viii. **Diao, X., Magalhaes, E. & Silver, J.** 2019. Cities and rural transformation: A spatial analysis of rural livelihoods in Ghana. *World Development*, 121: 141–157. https://doi.org/10.1016/j.worlddev.2019.05.001

ix. **Amare, M., Abay, K.A. & Chamberlin, J.** 2023. The role of spatial inequalities on youth migration decisions: Empirical evidence from Nigeria. *The Journal of Development Studies*, 59(6): 911–932. https://doi.org/10/gr82pc

x. **FAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport

xi. **Dinkelman, T. & Ngai, L.R.** 2022. Time use and gender in Africa in times of structural transformation. *Journal of Economic Perspectives*, 36(1): 57–80. https://doi.org/10.1257/jep.36.1.57

xii. **Jayachandran, S.** 2021. Social norms as a barrier to women's employment in developing countries. *IMF Economic Review*, 69(3): 576–595. https://doi.org/10.1057/s41308-021-00140-w

xiii. **FAO**. 2023. *The Status of Women in Agrifood Systems*. Rome. https://doi.org/10.4060/cc5343en

xiv. **ILO**. 2024. *Global Employment Trends for Youth2024. Decent work, brighter futures*. Geneva.

xv. **Dolislager, M., Reardon, T., Arslan, A., Fox, L., Liverpool-Tasie, S., Sauer, C. & Tschirley, D.L.** 2020. Youth and adult agrifood system employment in developing regions: Rural (peri-urban to hinterland) vs. urban. *The Journal of Development Studies*, 1–23. https://doi.org/10.1080/00220388.2020.1808198

xvi. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series 23–34. Rome, FAO. www.fao.org/documents/card/en/c/cc4337en

xvii. **FAO**. 2023. *RuLIS – Rural Livelihoods Information System.* [Cited 5 December 2023]. www.fao.org/in-action/rural-livelihoodsdataset-rulis/en

SPOTLIGHT 4.2 | CHILD LABOUR AMONG THE 15–17 COHORT

i. **FAO**. 2020. *FAO framework on ending child labour in agriculture*. Rome. https://doi.org/10.4060/ca9502en

ii. **Paus, T., Zijdenbos, A., Worsley, K., Collins, D.L., Blumenthal, J., Giedd, J.N., Rapoport, J.L. *et al.*** 1999. Structural maturation of neural pathways in children and adolescents: In vivo study. *Science*, 283(5409): 1908–1911. https://doi.org/10.1126/science.283.5409.1908

iii. **Sawyer, S.M., Azzopardi, P.S., Wickremarathne, D. & Patton, G.C.** 2018. The age of adolescence. *The Lancet Child & Adolescent Health*, 2(3): 223–228. https://doi.org/10.1016/S2352-4642(18)30022-1

iv. **FAO & ILO**. 2021. *Tackling child labour through decent youth employment in agri-food systems*. Rome. https://doi.org/10.4060/cb7441e

v. **United Nations**. 1973. *Convention C138 – Minimum Age Convention, 1973 (No. 138)* adopted 26 June 1973 by the General Conference of the International Labour Organization at its fifty-eighth session, New York, USA. www.ohchr.org/en/instruments-mechanisms/instruments/minimum-age-convention-1973-no-138

vi. **ILO**. 1999. *Convention C182 – Worst Forms of Child Labour Convention, 1999 (No. 182)*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_norm/@declaration/documents/publication/wcms_decl_fs_46_en.pdf

vii. **Thévenon, O. & Edmonds, E.** 2019. *Child labour: Causes, consequences and policies to tackle it*. OECD Social, Employment and Migration Working Papers 235. Paris, OECD Publishing. https://doi.org/10.1787/f6883e26-en

viii. **ILO & UNICEF**. 2021. *Child Labour: Global estimates 2020, trends and the road forward*. New York, USA. www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_797515.pdf

ix. **ILO**. 2007. World Day Against Child Labour: 12 June 2017. An overview of child labour in agriculture. In: *ILO and the International Programme on the Elimination of Child Labour*. New York, USA. [Cited 14 April 2025]. www.ilo.org/sites/default/files/wcmsp5/groups/public/@asia/@ro-bangkok/documents/publication/wcms_098346.pdf

x. **Doss, C.R., Heckert, J., Myers, E., Pereira, A. & Quisumbing, A.** 2020. Gender, rural youth and structural transformation: evidence to inform innovative youth programming. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3520616

xi. **Hossain, Md.M., Abdulla, F., Hai, A., Khan, M.T.F., Rahman, A. & Rahman, A.** 2023. Exploring the prevalence, duration and determinants of participation in household chores among children aged 5–17 years in Bangladesh. *Child Indicators Research*, 16(5): 2107–2124. https://doi.org/10.1007/s12187-023-10051-z

xii. **FAO**. 2022. *The COVID-19 consequences on child labour in agrifood systems*. Rome. https://doi.org/10.4060/cc2136en

xiii. **André, P., Delesalle, E. & Dumas, C.** 2021. Returns to farm child labor in Tanzania. *World Development*, 138: 105181. https://doi.org/10.1016/j.worlddev.2020.105181

xiv. **Webbink, E., Smits, J. & de Jong, E.** 2012. Hidden child labor: Determinants of housework and family business work of children in 16 developing countries. *World Development*, 40(3): 631–642. https://doi.org/10.1016/j.worlddev.2011.07.005

xv. **FAO, IFAD & ILO, eds.** 2010. *Gender dimensions of agricultural and rural employment: Differentiated pathways out of poverty: Status, trends and gaps*. Geneva. www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/documents/publication/wcms_150558.pdf

xvi. **Chiodi, V. & Escudero, V.** 2024. More is more: Combined livelihood-education interventions and their effect on child labour in the agricultural sector. *Journal of Development Effectiveness*, 17(1): 1–25. https://doi.org/10.1080/19439342.2024.2376559

xvii. **Kazianga, H., de Walque, D. & Alderman, H.** 2012. Educational and child labour impacts of two food-for-education schemes: Evidence from a randomised trial in rural Burkina Faso. *Journal of African Economies*, 21(5): 723–760. https://doi.org/10.1093/jae/ejs010

SPOTLIGHT 4.3 | INDIGENOUS YOUTH'S WORK AND ACCESS TO ASSETS AND RESOURCES IN AGRIFOOD SYSTEMS

i. **Dhir, R.K., Cattaneo, U., Cabrera Omarza, M.V., Coronado, H. & Oelz, M.** 2019. *Implementing the ILO indigenous and tribal peoples convention No. 169: Towards an inclusive, sustainable, and just future*. Geneva, International Labour Organization. www.ilo.org/publications/implementing-ilo-indigenous-and-tribal-peoples-convention-no-169-towards

ii. **FAO**. 2021. *The White/Wiphala Paper on Indigenous Peoples' food systems*. Rome. https://doi.org/10.4060/cb4932en

iii. **ILO**. 2017. *Decent Work for Indigenous and tribal peoples in the Rural Economy*. Decent Work in the Rural Economy Guidance Notes. Geneva. www.ilo.org/publications/decent-work-indigenous-and-tribal-peoples-rural-economy

iv. **LAC Indigenous Youth Network**. 2024. *Vision and contributions of Indigenous Youth towards COP-16 of the Convention on Biological Diversity*. La Paz, Fondo para el Desarrollo de los Pueblos Indígenas de América Latina y El Caribe and Red de Jóvenes Indígenas de América Latina y el Caribe.

v. **ILO**. 2023. *Traditional Occupations of Indigenous and Tribal Peoples in Labour Statistics*. Geneva. www.ilo.org/publications/traditional-occupations-indigenous-and-tribal-peoples-labour-statistics

vi. **Trakansuphakon, N.** 2020. Pgaz K'Nyau community social enterprise as alternative livelihoods for young generations, Northern Thailand. *Local Biodiversity Outlooks*, 1 June 2020. [Cited 4 June 2025 https://localbiodiversityoutlooks.net/pgaz-knyau-community-social-enterprise-as-alternative-livelihoods-for-young-generations-Northern-thailand

vii. **Van Uffelen, A., Tanganelli, E., Gerke, A., Bottigliero, F., Drieux, E., Fernández-de-Larrinoa, Y., Milbank, C. *et al.*** 2021. *Indigenous youth as agents of change – Actions of Indigenous youth in local food systems during times of adversity*. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/9b9c4c3f-c370-4266-9c11-2a938e25fa04/content

viii. **Asselin, H. and Drainville, R.** 2020. Are Indigenous youth in a tug-of-war between community and city? Reflections from a visioning workshop in the Lac Simon Anishnaabeg community (Quebec, Canada), *World Development Perspectives*, 17: 100168. https://doi.org/10.1016/j.wdp.2019.100168

ix. **Bruno, Ch., Bruno, C., Cruz, A., Moncada, S., Patterson, K., Rodriguez, B., Skene, D. *et al***. 2025 North American urban Indigenous food systems. *Current Developments in Nutrition*, 104542. https://cdn.nutrition.org/action/showPdf?pii=S2475-2991%2825%2900001-0

x. **Intertribal Agriculture Council**. 2025. Youth. In: *Intertribal Agriculture Council*. Billings, MT. [Cited 4 June 2025]. www.indianag.org/youth

xi. **Ostrowski, L.** 2024. Bridging the worlds of traditional Indigenous knowledge and academia. In: *Indigenous Research*. [Cited 4 June 2025]. Edmonton, AB, University of Alberta, Arramat Project. www.ualberta.ca/en/impact/bridging-the-worlds-of-traditional-indigenous-knowledge-and-academia.html

xii. **Holley, S.** 2024. Indigenous Alaskan Sustainable Community (IASC) Sustainable Village Design led by a village's story. 2024 Indigenous Communities Fellowship. In: *MIT Solve*. Cambridge, MA. [Cited 23 April 2024]. https://solve.mit.edu/solutions/90329

xiii. **FAO**. 2025. UN Global Indigenous Youth Forum (UNGIYF). In: *FAO*. Rome. [Cited 4 June 2025]. www.fao.org/indigenous-peoples/secretariats/ungiyf/en

xiv. **Flores Cruz, R.M.** 2024. Wind farms, access to land and territorial defence in the Isthmus of Tehuantepec. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 77–84. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xv. Consultations (UNGIYF 2023, WFF 2022–2025) with Indigenous youth leaders/founders of the Koibatek Ogiek Women and Youth Network. Consultations (UNGIYF 2023) with Indigenous youth leaders from Namibia who are engaged with the Kaokoland Descendent Welfare Organization (KADEWO), and the Eastern and South Africa Pastoralist Network (ESAPN).

xvi. **Edwards, N.** 2024. Implications of pastoral transformation from nomadic to sedentary livelihood systems among pastoral Indigenous (Maasai) on food security in the Kiteto District. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 12–19. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xvii. **Mohamed, G.I.** 2024. Kel Tamashek's alimentary resilience in the face of climate change. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 20-25. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xviii. Consultations (WFF 2022–2024, UNGIYF 2023, UNPFII 2025) with Saami Youth leaders and the International Centre for Reindeer Husbandry (ICR), referenced **in Curry, T.** 2019. *Herding on Thin Ice – An Exercise in Resilience and Adaptive Strategy*. https://reindeerherding.org/documents/category/5-articles-papers?download=37:herding-on-thin-ice-an-exercise-in-resilience-and-adaptive-strategy

xix. Consultations (UNGIYF 2023, WFF 2024) with Inuit Youth leaders from Nunavut and Alaska, referenced in **Behe, C.** 2019. *The role of providing – Inuit management practices: Youth, elders, active hunters and gatherers workshop report.* Bethel, Alaska, Inuit Circumpolar Council. DOI:10.13140/RG.2.2.21286.19520

xx. **Zakharova, I.** 2024. Reindeer herding: Keeping the Even culture alive and contributing to food security. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 34–43. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xxi. **Tambieva, M.** 2024. Karachay and Balkar Indigenous Peoples zero-waste philosophy and lifestyle. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 63–73. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xxii. Consultations (UNGIYF 2023, WFF 2024) with Ni-Vanuatu Indigenous Youth leaders.

xxiii. **Manoa, S.** 2024. Q&A: Exploring indigenous knowledge to foster sustainable fishing practices. In*: FFA Pacific Islands Forum Fisheries Agency Fisheries.* [Cited 27 February 2024]. Honiara, Solomon Islands. www.ffa.int/2024/02/qa-exploring-indigenous-knowledge-to-foster-sustainable-fishing-practices

xxiv. Consultations (WFF 2022, UNGIYF 2023, WFF 2024, UNPFII 2025) with Indigenous youth leaders from Australia, referenced in **Thean, E.** 2023. Harnessing cultural heritage for environmental conservation: Insights from Malachi Johnson. In: *AWX*. [Cited 23 August 2023].Fortitude Valley, QL. www.awx.com.au/harnessing-cultural-heritage-for-environmental-conservation-insights-from-malachi-johnson

xxv. Consultations (WFF 2022, UNGIYF 2023) with Indigenous Youth leaders from Hawai'I, referenced in **Kamelamela, K.L, Kihalani Springer, H., Ku'ulei Keakealani, R., Ulu Ching, M., Ticktin, T., Dickens Ohara, R., Parsons, E.W. *et al.*** 2022. Kōkua aku, Kōkua mai: An indigenous consensus-driven and place-based approach to community led dryland restoration and stewardship. *Forest Ecology and Management*, 506: 119949. https://doi.org/10.1016/j.foreco.2021.119949

xxvi. **Walters, J.** 2024. Chiefs of our Whenua. *Knowledge Makers Journal, Special Edition: Indigenous Women, Indigenous Peoples' Food and Knowledge Systems, and Climate Action,* 8: 133–138. https://openknowledge.fao.org/handle/20.500.14283/cd3373en

xxvii. **Australian Institute of Health and Welfare**. 2021. Aboriginal and Torres Strait Islander Health Performance Framework. In: *Australian Government*. Canberra. [Cited 7 May 2025]. http://indigenoushpf.gov.au/measures/2-07-employment#:~:text=Based%20on%20the%202021%20Census,07.4

xxviii. **de Brey, C. Musu, L., McFarland, J., Wilkinson-Flicker, S., Diliberti, M., Zhang, A., Branstetter, C. *et al.*** 2019. *Status and trends in the education of racial and ethnic groups 2018*. Washington, DC, National Center for Education Statistics. https://nces.ed.gov/use-work/resource-library/report/compendium/status-and-trends-education-racial-and-ethnic-groups-2018?pubid=2019038

xxix. **US Department of Labor**. 2019. *Findings from the National Agricultural Workers Survey (NAWS) 2000–2009: Profiles of youth, parents, and children of farm workers in the United States*. Washington, DC. https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS_Research_Report_10.pdf

xxx. **Sarigumba, M.P., Soriano, M., Robson, J.P., Quiviquivi, I. & Cabrera, O.L.** 2023. Understanding the role of youth in Indigenous territorial governance. *Frontiers in Environmental Science*, 11. https://doi.org/10.3389/fenvs.2023.1200434

xxxi. **World Bank.** 2015. *Indigenous Latin America in the twenty-first century*. Washington, DC. https://documents1.worldbank.org/curated/en/145891467991974540/pdf/Indigenous-Latin-America-in-the-twenty-first-century-the-first-decade.pdf

xxxii. **Coneval (Consejo Nacional de Evaluación de la Política de Desarrollo Social)**. 2020. Avances y Retos del Programa Jóvenes Construyendo el Futuro [Progress and challenges of program for young people building the future]. Communicado no. 10, 9 July 2020. Mexico City. www.coneval.org.mx/SalaPrensa/Comunicadosprensa/Documents/2020/Comunicado_10_JOVENES_CONSTRUYENDO_EL_FUTURO.pdf

xxxiii. **Cultural Survival**. 2024. 48-3: Indigenous Education: Safeguarding Our Knowledge for Future Generations. *Cultural Survival*, 15 September 2024. www.culturalsurvival.org/publications/cultural-survival-quarterly/48-3-indigenous-education-safeguarding-our-knowledge

xxxiv. **Stewart, K. & Brady-Runsabove, C.** 2024. *Center us: A Native youth survey report*. Washington, DC, The Aspen Institute, Center for Native American Youth. www.cnay.org/wp-content/uploads/2024/10/Center-Us-Report-2024_FINAL-compressed.pdf

CHAPTER 5

BOX 5.1 | ADOLESCENT AND YOUTH PREGNANCY

i. **Sully, E.A., Biddlecom, A., Darroch, J.E., Riley, T., Ashford, L.S., Lince-Deroche, N., Firestein, L. *et al.*** 2020. *Adding it up: Investing in sexual and reproductive health 2019*. New York, USA, Guttmacher Institute. www.guttmacher.org/report/adding-it-up-investing-in-sexual-reproductive-health-2019

ii. **Pradhan, R., Wynter, K. & Fisher, J.** 2015. Factors associated with pregnancy among adolescents in low-income and lower middle-income countries: A systematic review. *Epidemiology and Community Health*, 69(9): 918–924. https://doi.org/10.1136/jech-2014-205128

iii. **The Lancet**. 2025. Dismantling barriers and biases against adolescent mothers. *The Lancet Child & Adolescent Health*, 9(5): 283. https://doi.org/10.1016/S2352-4642(25)00105-1

iv. **Dev, A. & Rabi, B., Poobalan, A.S. & van Teijlingen, E.R.** 2010. Factors associated with teenage pregnancy in South Asia: A systematic review. *Health Science Journal*, 4(1). www.researchgate.net/publication/228462180_Factors_associated_with_teenage_pregnancy_in_South_Asia_A_systematic_review

v. **UNICEF**. 2021. *Towards ending child marriage: Global trends and profiles of progress*. New York, USA. https://data.unicef.org/resources/towards-ending-child-marriage

vi. **Sabet, F., Prost, A., Rahmanian, S., Al Qudah, H., Nogueira Cardoso, M. & Carlin, J.B.** 2023. The forgotten girls: The state of evidence for health interventions for pregnant adolescents and their newborns in low-income and middle-income countries, *Health Policy*, 402(10412): 1580–1596. https://doi.org/10.1016/S0140-6736(23)01682-3

vii. **Zambia Statistics Agency, Ministry of Health (MOH) Zambia and ICF**. 2019. 2018 Zambia Demographic Health Survey Summary Report. Lusaka. https://dhsprogram.com/pubs/pdf/SR265/SR265.pdf

viii. **Urindwanayo, D. & Richter, S.** 2020. Teenage pregnancy in refugee camps: A narrative synthesis. *Journal of International Women's Studies*, 21(1): 255–270. https://vc.bridgew.edu/jiws/vol21/iss1/20

BOX 5.2 | DATA GAPS

i. **Neufeld, L.M., Andrade, E.B., Ballonoff Suleiman, A., Barker, M., Beal, T., Blum, L.S., Demmler, K.M. *et al.*** 2022. Food choice in transition: Adolescent autonomy, agency, and the food environment. *The Lancet*, 399(10320): 185–197. https://doi.org/10.1016/S0140-6736(21)01687-1

ii. **FAO & WHO GIFT**. undated. Global Individual Food Consumption Data Tool. In: *FAO.* Rome. [Cited 23 September 2024]. www.fao.org/gift-individual-food-consumption/data/en

iii. **WHO**. undated. Food Safety Collaborative Platform. In: *WHO Data.* Geneva. [Cited 23 September 2024]. https://apps.who.int/foscollab

iv. **WHO**. undated. WHO Collaborating Centres Global Database. In: *WHO Data.* Geneva [Cited 23 September 2024]. https://apps.who.int/whocc/Default.aspx

v. **WHO**. undated. Adolescent health indicators recommended by the Global Action for Measurement of Adolescent health (GAMA). In: *WHO Data*. [Cited 23 September 2024]. https://platform.who.int/data/maternal-newborn-child-adolescent-ageing/static-visualizations

BOX 5.3 | CONTEXT AND COHORT-SPECIFIC DIETARY TRENDS

i. **Neufeld, L.M., Andrade, E.B., Ballonoff Suleiman, A., Barker, M., Beal, T., Blum, L.S., Demmler, K.M. *et al.*** 2022. Food choice in transition: Adolescent autonomy, agency, and the food environment. *The Lancet*, 399(10320): 185–197. https://doi.org/10.1016/S0140-6736(21)01687-1

ii. **WHO & FAO**. 2003. *Diet, nutrition and the prevention of chronic diseases: Report of a Joint WHO/FAO Expert Consultation*. WHO Technical Report Series 916. Geneva. https://iris.who.int/bitstream/handle/10665/42665/WHO_TRS_916.pdf?sequence=1

BOX 5.4 | BODY IDEALS INFLUENCE DISORDERED EATING BEHAVIOURS GLOBALLY

i. **Mallick, N., Ray, S. & Mukhopadhyay, S.** 2014. Eating behaviours and body weight concerns among adolescent girls. *Advances in Public Health*, 2014(1): 257396. https://doi.org/10.1155/2014/257396

ii. **Boncyk, M., Rampalli, K., Winters, M., Makkar, M. & Blake, C.** 2023. Characteristics of actors used to promote healthy and unhealthy foods and beverages in Ghana television advertisements. *Current Developments in Nutrition*, 7(Suppl 1):100816 https://doi.org/10.1016/j.cdnut.2023.100816

iii. **Thornborrow, T., Evans, E.H., Tovee, M.J. & Boothroyd, L.G.** 2022. Sociocultural drivers of body image and eating disorder risk in rural Nicaraguan women. *Journal of Eating Disorders*, 10(1): 133. https://doi.org/10.1186/s40337-022-00656-0

iv. **Swinburn, B.A., Sacks, G., Hall, K.D., McPherson, K., Finegood, D.T., Moodie, M.L. & Gortmaker, S.L.** 2011. The global obesity pandemic: Shaped by global drivers and local environments. *The Lancet*, 378(9793): 804–814. https://doi.org/10.1016/S0140-6736(11)60813-1

v. **Savoy, S. & Boxer, P.** 2020. The impact of weight-biased media on weight attitudes, self-attitudes, and weight-biased behavior. *Psychology of Popular Media*, 9(1): 31–44. https://doi.org/10.1037/ppm0000232

vi. **Ata, R.N. & Thompson, J.K.** 2010. Weight bias in the media: A review of recent research. *Obesity Facts*, 3(1): 41–46. https://doi.org/10.1159/000276547

vii. **Michels, N. & Amenyah, S.D.** 2017. Body size ideals and dissatisfaction in Ghanaian adolescents: Role of media, lifestyle and well-being. *Public Health*, 146: 65–74. https://doi.org/10.1016/j.puhe.2017.01.006

viii. **Daniel, L., Haile, D. & Egata, G.** 2023. Disordered eating behaviours and body shape dissatisfaction among adolescents with type 1 diabetes: A cross-sectional study. *Journal of Eating Disorders*, 11(1): 169. https://doi.org/10.1186/s40337-023-00876-y

ix. **Nilsson, F., Madsen, J.O.B., Jensen, A.K., Olsen, B.S. & Johannesen, J.** 2020. High prevalence of disordered eating behavior in Danish children and adolescents with type 1 diabetes. *Pediatric Diabetes*, 21(6): 1043–1049. https://doi.org/10.1111/pedi.13043

x. **Gerbasi, M.E., Richards, L.K., Thomas, J.J., Agnew-Blais, J.C., Thompson-Brenner, H., Gilman, S.E. & Becker, A.E.** 2014. Globalization and eating disorder risk: Peer influence, perceived social norms, and adolescent disordered eating in Fiji. *International Journal of Eating Disorders*, 47(7): 727–737. https://doi.org/10.1002/eat.22349

xi. **Nivedita, N., Sreenivasa, G., Sathyanarayana Rao, T.S. & Malini, S.S.** 2018. Eating disorders: Prevalence in the student population of Mysore, South India. *Indian Journal of Psychiatry*, 60(4): 433–437. https://doi.org/10.4103/psychiatry.IndianJPsychiatry_97_16

xii. **Kronfol, Z., Khalifa, B., Khoury, B., Omar, O., Daouk, S., deWitt, J.P., ElAzab, N. *et al.*** 2018. Selected psychiatric problems among college students in two Arab countries: Comparison with the USA. *BMC Psychiatry*, 18(1): 147. https://doi.org/10.1186/s12888-018-1718-7

BOX 5.5 | YOUTH ENGAGEMENT IN AGRIFOOD SYSTEMS TRANSFORMATION FOR FOOD SECURITY AND NUTRITION

i. **Global Forum on Migration and Development**. undated. International Young Farmers' Exchange Program (IYFEP) between Uganda and Germany. *GFMD*. Geneva. [Cited 18 January 2025]. www.gfmd.org/pfp/ppd/18761

ii. **WFF (World Food Forum)**. 2023. *Opportunities and barriers for advancing agrifood systems*. Rome, FAO. https://doi.org/10.4060/cc6666en

iii. **Spencer-Jolliffe, N.** 2023. Elixir Foods turns cocoa waste into health-conscious sweetener. *Global Insights,* 13 July 2023. https://insights.figlobal.com/sweeteners/elixir-foods-turns-cocoa-waste-into-health-conscious-sweetener

iv. **Tauzie, M., Hermans, T.D.G. & Whitfield, S.** 2024. The New Achikumbe elite: Food systems transformation in the context of digital platforms use in agriculture in Malawi. *Agriculture and Human Values*, 41(2): 475–489. https://doi.org/10.1007/s10460-023-10494-8

v. **FAO & WFF**. 2024. *Digital technologies for multidimensional youth engagement in agrifood systems transformation*. Rome. https://openknowledge.fao.org/handle/20.500.14283/cd2715en

CHAPTER 6

BOX 6.1 | MEASURING MATERIAL AND SUBJECTIVE RESILIENCE

i. **FAO**. n.d. Resilience Index Measurement and Analysis (RIMA). In: Agrifood Economic. Rome [Cited 4 June 2025]. www.fao.org/agrifood-economics/areas-of-work/rima/en

ii. **Cox, R.S. & Perry, K-M.E.** 2011. Like a fish out of water: Reconsidering disaster recovery and the role of place and social capital in community disaster resilience. *American Journal of Community Psychology*, 48(3): 395–411. https://doi.org/10.1007/s10464-011-9427-0

SPOTLIGHT 6.1 | YOUTH RADICALIZATION AND PARTICIPATION IN ARMED CONFLICTS

i. **Mayhew, L., McCullough, A., El Taraboulsi-McCarthy, S., Allen, A. & Levine, S.** 2022. *The intersection between socioeconomic conditions and youth radicalisation: Implications for programming in the G5 Sahel countries*. Rome, FAO. https://doi.org/10.4060/cb8658en

ii. **Urdal, H.** 2006. A clash of generations? Youth bulges and political violence. *International Studies Quarterly*, 50(3): 607–629. https://doi.org/10.1111/j.1468-2478.2006.00416.x

iii. **Collier, P. & Sambanis, N.** 2002. Understanding civil war: A new agenda. *Journal of Conflict Resolution*, 46(1): 3–12. https://doi.org/10.1177/0022002702046001001

iv. **Sambe, B., Dicko, A.R., Moussa, I., Oumarou, I.& Dodo Issaka, M.S.** 2018. *Youth violence and the challenges of violent extremism in Zinder*. Geneva, International Organization for Migration. https://publications.iom.int/system/files/pdf/youth_violence_en.pdf

v. **Meagher, K. & Hassan, I.H.** 2020. Informalization & its discontents: The informal economy and Islamic radicalization in Northern Nigeria. In: *Overcoming Boko Haram: Faith, society and Islamic radicalization in Northern Nigeria*. pp. 244–274. Western Africa Series. Martlesham, UK, Boydell & Brewer. https://doi.org/10.1017/9781787446595.013

vi. **McCullough, A. and Diwakar, V.** 2019. *Resilience and sustainable poverty escapes in Niger.* London, ODI; USAID. www.researchgate.net/publication/333619484_Resilience_and_Sustainable_Poverty_Escapes_in_Niger

vii. **Last, M.** 2020. An inquiry into possible factors contributing to radicalization in childhood and youth in Northern Nigeria. In: K. Meagher and I.H. Hassan, eds. *Overcoming Boko Haram: Faith, society and Islamic radicalization in Northern Nigeria*. pp. 225–243. Western Africa Series. Martlesham, UK, Boydell and Brewer. https://doi.org/10.1515/9781787446595-014

viii. **Global Initiative against Transnational Organized Crime**. 2024. Observatory of violence in Haiti. *Risk bulletins*, 1. https://riskbulletins.globalinitiative.net/download/ht-obs-001-screen-pdf.pdf

ix. **Raineri, L.** 2022. Explaining the Rise of Jihadism in Africa: The crucial case of the Islamic State of the Greater Sahara. *Terrorism and Political Violence*, 34(8): 1632–1646. https://doi.org/10.1080/09546553.2020.1828078

x. **ACAPS (Assessment Capacities Project).** 2024. HAITI Impact of conflict on children and youth. In: *ACAPS*. [Cited 4 June 2025]. www.acaps.org/fileadmin/Data_Product/Main_media/20240930_ACAPS_Haiti_-_Impact_of_conflict_on_children_and_youth.pdf

xi. **Ehrhardt, D. & Umar, M.S.** 2020. Pathways to radicalization: Learning from Boko Haram life histories. In: K. Meagher and I.H. Hassan, eds. *Overcoming Boko Haram: Faith, society and Islamic radicalization in Northern Nigeria*. pp. 169–192. Western Africa Series. Boydell & Brewer. https://doi.org/10.1017/9781787446595.010

xii. **van der Heide, L. & Coleman, J. 2020.** *The last frontier: Prisons and violent extremism in Mali*. The Hague, International Centre for Counter-Terrorism. www.jstor.org/stable/resrep25262

xiii. **Nilsson, R. A.** 2008. Dangerous liaisons: Why ex-combatants return to violence. Cases from the Republic of Congo and Sierra Leone. Uppsala University, Disciplinary Domain of Humanities and Social Sciences, Faculty of Social Sciences, Department of Peace and Conflict Research. PhD Dissertation. https://uu.diva-portal.org/smash/record.jsf?pid=diva2%3A172980&dswid=7530

xiv. **Utas, M.** 2003. Sweet battlefields: Youth and the Liberian Civil War. Uppsala University, Department of Cultural Anthropology and Ethnology. PhD Dissertation. www.diva-portal.org/smash/get/diva2:163000/FULLTEXT01.pdf

xv. **Keen, D.** 2014. Incentives and disincentives for violence. In: M. Berdal & D. Malone, eds. *Greed and grievance: Economic agendas in civil wars*. pp. 19–42. Boulder, CO, Lynne Rienner. www.idrc.ca/EN/Resources/Publications

xvi. **McMullin, J.** 2003. Reintegration of combatants: Were the right lessons learned in Mozambique? *International Peacekeeping*, 11(4): 625–643. https://doi.org/10.1080/1353331042000248704

CHAPTER 7

BOX 7.1 | SOCIAL PROTECTION AND YOUTH

i. **SPIAC-B (Social Protection Inter-Agency Cooperation Board)**. 2019. *Collaboration for policy coherence and development impact*. New York, USA. [Cited 3 April 2023]. www.socialprotection.org/discover/publications/collaborating-policy-coherence-and-development-impact

ii. **FAO.** 2017. *FAO Social Protection Framework: Promoting rural development for all*. Rome. https://openknowledge.fao.org/items/5ea66b96-33fe-4120-b489-a41c9d234411

iii. **Araujo, C, Baird, S., Das, S., Özler, B., Parisotto, L. & Woldehanna, W.** 2024. *Social protection and youth*. Policy Research Working Paper No. 10832. Washington, DC, World Bank. https://dds.cepal.org/redesoc/publicacion?id=6062

iv. **Duflo, E., P. Dupas, and M. Kremer. 2023**. The impact of secondary school subsidies on career trajectories in a dual labor market: Experimental evidence from Ghana. http://economics.mit.edu/sites/default/files/2024-07/2024.06%20The%20Impact%20of%20Secondary%20School%20Subsidies%20on%20Career.pdf

BOX 7.2 | YOUTH MAINSTREAMING IN NATIONAL AGRICULTURAL POLICIES

i. **FAO**. FAOLEX database. In: *FAO. Rome.* [Cited 24 April 2025]. www.fao.org/faolex/en

ii. **African Union Commission**. 2022. *African Agribusiness Youth Strategy*. Addis Ababa. https://au.int/sites/default/files/documents/42281-doc-agribusiness.pdf0

APPENDICES AND GLOSSARY

APPENDIX 1

1. **FAO**. 2024. *The State of Food and Agriculture 2024: Value-driven transformation of agrifood systems*. Rome. https://doi.org/10.4060/cd2616en

2. **Arslan, A., Cattaneo, A., Humanes, M.B., McMenomy, T., Ranuzzi, E. & Sadiddin, A.** 2024. *A typology for agrifood systems.* Background paper for *The State of Food and Agriculture 2024.* Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/9aa2f64e-f9b5-44f2-b6e7-dfb6eedbc7df/content

3. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512

4. **Ambikapathi, R., Schneider, K.R., Davis, B., Herrero, M., Winters, P. & Fanzo, J.C.** 2022. Global food systems transitions have enabled affordable diets but had less favourable outcomes for nutrition, environmental health, inclusion and equity. *Nature Food*, 3(9): 764–779. https://doi.org/10.1038/s43016-022-00588-7

5. **Lichter, D.T. & Brown, D.L.** 2011. Rural America in an urban society: Changing spatial and social boundaries. *Annual Review of Sociology*, 37: 565–592. https://doi.org/10.1146/annurev-soc-081309-150208

6. **UNDESA**. 2019. *World urbanization prospects: The 2018 revision*. New York, USA. https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf

7. **Champion, T. & Hugo, G., eds.** 2004. *new forms of urbanization: Beyond the urban-rural dichotomy*. 1st edition. London, Routledge. https://doi.org/10.4324/9781315248073

8. **Love, H. & Loh, T.H.** 2020. The rural-urban divide furthers myths about race and poverty –concealing effective policy solutions. *Brookings*, 8 December 2020. www.brookings.edu/articles/the-rural-urban-divide-furthers-myths-about-race-and-poverty-concealing-effective-policy-solutions

9. **Lerner, A.M. & Eakin, H.** 2011. An obsolete dichotomy? Rethinking the rural–urban interface in terms of food security and production in the global south. *The Geographical Journal*, 177(4): 311–320. https://doi.org/10.1111/j.1475-4959.2010.00394.x

10. **Webster, D.** 2011. An overdue agenda: Systematizing East Asian peri-urban research. *Pacific Affairs*, 84(4): 631–642.

11. **Cattaneo, A., Adukia, A., Brown, D.L., Christiaensen, L., Evans, D.K., Haakenstad, A., McMenomy, T. *et al.*** 2022. Economic and social development along the urban–rural continuum: New opportunities to inform policy. *World Development*, 157: 105941. https://doi.org/10.1016/j.worlddev.2022.105941

12. **Christiaensen, L. & Kanbur, R.** 2017. Secondary towns and poverty reduction: Refocusing the urbanization agenda. *Annual Review of Resource Economics*, 9: 405–419. https://doi.org/10.1146/annurev-resource-100516-053453

13. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome. www.ifad.org/ruraldevelopmentreport

14. **Abay, K.A., Asnake, W., Ayalew, H., Chamberlin, J. & Sumberg, J.** 2020. Landscapes of opportunity: Patterns of young people's engagement with the rural economy in sub-Saharan Africa. *The Journal of Development Studies*, 57(4): 1–20. https://doi.org/10.1080/00220388.2020.1808195

15. **Wiggins, S. & Proctor, S.** 2001. How special are rural areas? The economic implications of location for rural development. *Development Policy Review*, 19(4): 427436. https://doi.org/10.1111/1467-7679.00142

16. **Sumberg, J., Chamberlin, J., Flynn, J., Glover, D. & Johnson, V.** 2020. Landscapes of rural youth opportunity. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3521380
17. **Fischer, G., Nachtergaele, F.O., van Velthuizen, H.T., Chiozza, F., Franceschini, G., Henry, D., Muchoney, D. & Tramberend, S.** 2021. Global Agro-Ecological Zones (GAEZ) V4 – Model documentation. Rome, FAO. [Cited 25 July 2024]. https://iiasa.ac.at/models-tools-data/gaez
18. **Cattaneo, A., Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences*, 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118
19. **Collins Bartholomew & GSMA**. 2024. Coverage – Collins Bartholomew Coverage Mapping. Map the world with Collins Coverage. In: *Collins Bartholomew*. [Cited 20 March 2024]. www.collinsbartholomew.com/coverage-mapping
20. **Ulm, M., Widhalm, P. & Brändle, N.** 2015. Characterization of mobile phone localization errors with OpenCellID data. Conference presentation at the 2015 4th International Conference on Advanced Logistics and Transport (ICALT), May 2015. https://doi.org/10.1109/ICAdLT.2015.7136601
21. **Greenacre, M., Groenen, P.J.F., Hastie, T., D'Enza, A.I., Markos, A. & Tuzhilina, E.** 2022. Principal component analysis. *Nature Reviews Methods Primers*, 2(1): 1–21. https://doi.org/10.1038/s43586-022-00184-w

APPENDIX 2

1. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series 23–34. Rome, FAO. www.fao.org/documents/card/en/c/cc4337en
2. **ILO**. 2022. ILOSTAT. In: *ILOSTAT*. [Cited 5 February 2025]. https://ilostat.ilo.org/
3. **ILO**. 2024 ILO Harmonized Microdata, https://ilostat.ilo.org/
4. **Papke, L.E. & Wooldridge, J.M.** 2008. Panel data methods for fractional response variables with an application to test pass rates. *Journal of Econometrics*, 145(1): 121–133. https://doi.org/10.1016/j.jeconom.2008.05.009
5. **Mundlak, Y.** 1978. On the pooling of time series and cross section data. *Econometrica*, 46(1): 69–85. https://doi.org/10.2307/1913646
6. **Chamberlain, G.** 1980. Analysis of covariance with qualitative data. *The Review of Economic Studies*, 47(1): 225–238. https://doi.org/10.2307/2297110
7. **FAO.** 2024. *Employment in agrifood systems*. *FAOSTAT*. Rome. [Cited 1 January 2025]. www.fao.org/faostat/en/#data/OEA

APPENDIX 3

1. **Davis, B., Mane, E., Gurbuzer, Y.L., Caivano, G., Piedrahita, N., Schneider, K.R., Azhar, N. *et al.*** 2023. *Estimating global and country-level employment in agrifood systems*. FAO Statistics Working Paper Series 23–34. Rome, FAO. www.fao.org/documents/card/en/c/cc4337en
2. **FAO**. 2023. *RuLIS – Rural Livelihoods Information System*. Rome. [Cited 5 December 2023]. www.fao.org/in-action/ rural-livelihoodsdataset-rulis/en
3. **IFAD**. 2019. *2019 Rural Development Report. Creating opportunities for rural youth*. Rome, www.ifad.org/ruraldevelopmentreport
4. **Dolislager, M., Reardon, T., Arslan, A., Fox, L., Liverpool-Tasie, S., Sauer, C. & Tschirley, D.L.** 2020. Youth and adult agrifood system employment in developing regions: Rural (peri-urban to hinterland) vs. urban. *The Journal of Development Studies*, 57(4): 1–23. https://doi.org/10.1080/00220388.2020.1808198
5. **Alesina, A., Hohmann, S., Michalopoulos, S. & Papaioannou, E.** 2021. Intergenerational Mobility in Africa. *Econometrica*, 89(1): 1–35. https://doi.org/10.3982/ecta17018

GLOSSARY

1. **FAO**. undated. Glossary. Rome. [Cited 19 May 2025]. www.fao.org/3/cc5343en/online/status-women-agrifood-systems-2023/glossary.html
2. **Marshall, Q., Fanzo, J., Barrett, C.B., Jones, A.D., Herforth, A. & McLaren, R.** 2021. Building a global food systems typology: A new tool for reducing complexity in food systems analysis. *Frontiers in Sustainable Food Systems*, 5. https://doi.org/10.3389/fsufs.2021.746512
3. **FAO**. 2024. *The State of Food and Agriculture 2024*. Rome. https://doi.org/10.4060/cd2616en
4. **Franzel, S., Davis, K., Gammelgaard, J. & Preissing, J.** 2023. *Investing in young agripreneurs: Why and how?* Rome, FAO; IFPRI. https://doi.org/10.4060/cc2747en
5. **Hilmi, M.** 2018. Entrepreneurship in farming: What is the current status of knowledge in the Kurdistan Region of Iraq? In: *FAO Family Farming Knowledge Platform*. Rome. [Cited 4 June 2025]. www.fao.org/family-farming/detail/en/c/1172342/?utm_source=chatgpt.com
6. **Cattaneo, Nelson, A. & McMenomy, T.** 2021. Global mapping of urban–rural catchment areas reveals unequal access to services. *Proceedings of the National Academy of Sciences* 118(2): e2011990118. https://doi.org/10.1073/pnas.2011990118
7. **HLPE.** 2021. Promoting youth engagement and employment in agriculture and food systems. Rome. https://openknowledge.fao.org/server/api/core/bitstreams/bf72199b-eb52-4ecd-b9d7-ad329dfa7ede/content
8. **FAO.** 2022. *Investment guidelines for youth in agrifood systems in Africa*. Rome. https://doi.org/10.4060/cb9001en

© FAO/BELOUMOU OLOMO DANIEL IN YAOUNDÉ, CAMEROON, THÉRÈSE ANGOULA, COCOA FARMER, TURNS OVER COCOA BEANS IN A DRYER.

APPENDIX 1
AGRIFOOD SYSTEMS TYPOLOGY AND DEFINITION OF SPACES

AGRIFOOD SYSTEMS TYPOLOGY

This report adopts the agrifood systems typology developed for *The State of Food and Agriculture 2024*.[1,2] Building on the work of Marshall *et al.*,[3] the typology uses four structural and functional indicators to characterize national agrifood systems:[1,3]

1. *Value added per worker in agriculture, forestry and fisheries,* a measure of productivity associated with the stage of rural and structural transformation within a country and how effectively labour is utilized.

2. *Percentage of calories not derived from staples* (cereals, roots and tubers), which gauges dietary diversity and, by extension, food security and nutritional quality.

3. *Number of supermarkets per 100 000 people,* which highlights the role of modern retail in shaping food supply chains and consumer behaviour.

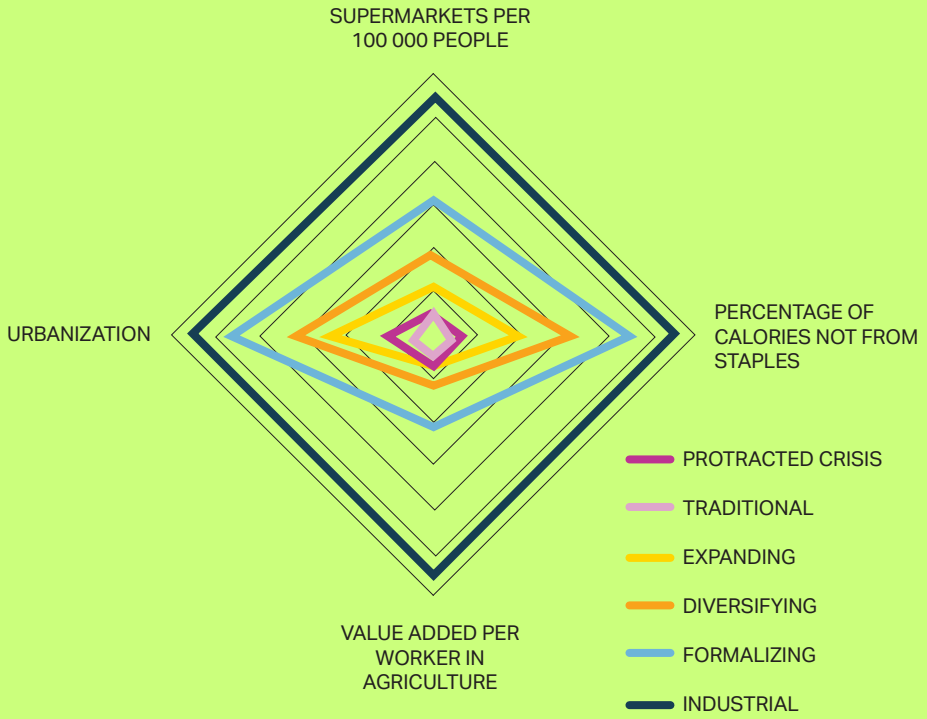
4. *Percentage of the population living in urban areas,* which serves as a proxy for how urbanization alters food environments.[1,3]

Each country was ranked on these four variables, and their average ranking was used to calculate a composite index. Based on this index, countries were grouped into five equally sized categories that reflect different stages of agrifood systems transition: *traditional, expanding, diversifying, formalizing and industrial*.[2] A sixth category, *protracted crisis*, encompassing countries identified by FAO as being in protracted crisis as of September 2023, was added to capture the unique food security challenges of countries and territories caused by prolonged economic, climatic and political crises. Figure A1.1 presents a radar chart illustrating the variable rankings across the six agrifood systems categories.[2]

The agrifood systems typology aligns broadly with income levels but provides a more nuanced view. For instance, although most high-income countries fall into the industrial category, some are classified as formalizing or even diversifying. Likewise, lower-middle-income countries appear across all categories except industrial, including several countries in protracted crisis. The six agrifood systems categories do not imply a unidirectional progression from a "less desired" traditional state to a "fully desired" industrial state. Rather, they represent a snapshot of where countries are in agrifood systems transition, and each is associated with unique opportunities and challenges related to productivity, inclusivity, sustainability and resilience[3,4] (see Chapter 1, Box 1.1 on the trade-offs associated with agrifood systems transition).

FIGURE A1.1

VARIABLE RANKINGS FOR THE AGRIFOOD SYSTEMS TYPOLOGY



Note: The values of the variables in the radar graphs are standardized between 0 and 1 for ease of presentation.

Source: Arslan *et al.* 2024. A typology for agrifood systems. Background paper for The State of Food and Agriculture 2024. Rome, FAO. https://openknowledge.fao.org/server/api/core/bitstreams/9aa2f64e-f9b5-44f2-b6e7-dfb6eedbc7df/content

DEFINING RURAL AND URBAN SPACES

The meaning of "rural" varies across contexts. Researchers and policymakers often rely on administrative classifications that define rural spaces based on criteria such as population size, economic dependence on agriculture and natural resources, and geographic isolation.[5,6] However, this approach has two limitations. First, administrative definitions vary across countries, particularly in terms of population thresholds. What constitutes an "urban" area may range from 5 000 to 50 000 people, which complicates cross-country and regional comparisons of rural and urban statistics.[7] Second, these definitions tend to emphasize a strict urban–rural divide, which oversimplifies the relationship between urban and rural areas.[5] This dichotomy overlooks the growing interconnections between these spaces, driven in part by the transformation of agrifood systems, which are strengthening the social and economic linkages between rural and urban areas.[8, 9] Indeed, the rise of secondary cities, rural densification and the growth of rural towns are blurring the physical and conceptual boundaries between urban and rural spaces. A more fluid definition, viewing spaces along a continuum, can better capture these complexities.[9, 10]

To address the challenges of comparability and the increasingly intertwined nature of urban and rural areas, this chapter has adopted a high-resolution global geospatial method known as the Urban-Rural Catchment Area (URCA) approach to define rural spaces.[11] The

URCA framework defines spatial categories primarily by travel time to urban centres and the population size of those centres. Urban centres are first stratified into categories based on their population (from 20 000 to over 5 million).[11] There are 30 URCA categories in total, where category one represents the largest cities, and the last category corresponds to the most remote areas. Adapting an approach from Cattaneo *et al.*,[18] the first nine categories are grouped as "Urban", the next three as "Peri-urban", the following nine as "Peri-rural" and the final two as "Hinterland". These groupings reflect differences in infrastructure, employment prospects and access to essential services. For broader comparative analyses, these four categories are collapsed into a simpler distinction between "urban" and "rural" areas. This is done by denoting as "rural" those areas classified as *peri-urban*, *hinterlands* and *peri-rural*. This approach not only improves cross-national and regional comparability of demographic and socioeconomic data, it also recognizes the increasing interconnectedness of rural and urban areas.[9,10] By incorporating travel time, it goes beyond static administrative boundaries and basic population threshold to account for actual accessibility and the functional relationships forged through shared labour markets, food value chains and services.[11, 12]

ECONOMIC OPPORTUNITY SPACE AT THE SUB-NATIONAL LEVEL

The extent of rural transformation and the availability of economically viable opportunities for rural youth can vary significantly across different regions within a single country, shaped by biophysical and socioeconomic factors.[13, 14] In resource-based sectors such as crop and livestock production, the agroecology of an area including soil type, climate and altitude determines which types of commodities can be produced.[13, 15] Their economic viability is further shaped by marketability, which depends on proximity to markets, population centres and the quality of rural infrastructure.[13, 15] While agroecological zones provide insights into agricultural potential, effective market access is essential for assessing commercialization opportunities.[15] Together, these elements create localized "economic opportunity spaces" that define the potential opportunities and constraints facing rural youth, subject to the broader developmental status of their national economy.[14] This means that even in countries with limited economic development or under-transformed agrifood systems, favourable agroecological conditions and effective market access can foster viable opportunities for youth engagement in agrifood systems.[16]

To explore how these subnational "economic opportunity spaces" intersect with rural youth livelihoods – and how youth can engage with, benefit from or contribute to agrifood systems – this report builds on prior work by Wiggins and Proctor[15] and IFAD [12] to delineate opportunity spaces based on agricultural productivity and connectivity (commercialization) potential. Expanding upon this framework, the report utilizes alternative indicators to evaluate both aspects. Specifically, agricultural potential is assessed using a measure of land productivity potential derived from FAO's Global Agro-Ecological Zone (GAEZ) data.[17] This metric represents the maximum possible yield for specific crops under given agroclimatic, soil and terrain conditions, applying specific management assumptions and agronomic input. It employs an eco-physiological crop growth model that integrates soil moisture conditions along with other climatic factors, such as radiation and temperature, during various crop development stages to calculate potential biomass production and yield.[17] To exclude the influence of human-driven factors on productivity, the measure used here focuses on rainfed and low-input farming systems, ensuring its exogeneity with respect to human variables.[17] Using the potential agricultural productivity as a measure of agricultural potential offers several advantages: it provides a theoretical upper limit on yield, enables characterization of agricultural spaces on a global scale, including areas beyond cultivated land, and utilizes inputs that generate potential yields which change slowly over time, thus offering a broader temporal reference not restricted to specific years or production levels.

Connectivity (commercialization) potential rises with increasing connectivity to urban centres and their markets and is, hence, proxied by a connectivity index, which reflects a rural area's physical and virtual access to markets, services and employment opportunities. Physical connectivity is assessed by measuring travel time and distance to various cities, categorized by population size following the URCA approach serving as a proxy for market access.[18, 19] This dimension reflects how easily rural youth can reach urban centres to access critical inputs or markets for their products. Digital connectivity is assessed by examining the availability of communication technologies, ranging from advanced

5G networks to older 1G systems, as well as areas lacking coverage entirely. The analysis uses cell tower data from OpenCellID,[l] the largest global project for collecting GPS positions of cell towers, which provides a representative sample[m] of cell phone coverage.[20] To effectively integrate these two dimensions into a single metric, a principal component analysis was applied. This statistical technique allowed the complex data to be distilled into a more manageable form, using the first principal component as a proxy for total connectivity.[21] By integrating both physical and digital connectivity into a single metric, it is possible to better understand the overall accessibility of rural areas and the potential opportunities available to youth.

By capturing both agroecological capacity and market dimensions, this economic geography framework offers a more comprehensive perspective on the economic spaces in which rural youth operate, ultimately informing strategies that can support their engagement and success in transforming agrifood systems. To facilitate interpretation, agricultural potential and commercialization potential were categorized into three ordinal classes each: low, middle and high. This two-step classification procedure begins by removing outliers, defined as the lowest and highest 3 percent of observations. Excluding outliers only for threshold computation safeguards against extreme values skewing the classification. Next, the remaining data range were divided into three equal-length intervals, reflecting the intrinsic scale and variability of the index rather than its statistical distribution. Unlike a quantile-based approach, which divides observations into groups of equal frequency and may cluster values tightly around common occurrences, this method preserves the full range of possible values, offering a more intuitive sense of the relative magnitude, particularly as the data are not evenly distributed and contain significant clusters around certain ranges.

Combining these ordinal categories of agricultural and commercialization potential yields five broad economic opportunity spaces, each representing unique configurations of opportunities and challenges for rural youth (Figure A1.2). These categories range from *diverse and high opportunities (HAHC)*, characterized by strong agricultural productivity potential and the greatest connectivity, to areas designated as *low opportunities* (LALC) that showcase weak connectivity potential with low agricultural potential. Between the two extremes are three broad intermediate categories. Spaces offering *moderate opportunities* are defined by combinations of at most medium levels of agricultural potential and commercialization potential (Medium Agricultural potential with Low Connectivity (MALC), Low Agricultural potential with Medium Connectivity (LAMC), and Medium Agricultural potential with Medium Connectivity (MAMC)). Additionally, rural spaces with strong connectivity potential but limited agricultural potential (Low Agricultural and High Connectivity (LAHC) and Medium Agricultural potential and High Connectivity (MAHC)) are designated as *strong market opportunities zones*, while those with limited connectivity but strong agricultural potential (High Agricultural potential but Low Connectivity (HALC) and High Agricultural potential and Medium Connectivity (HAMC)) are delineated as offering *strong agricultural opportunities.*

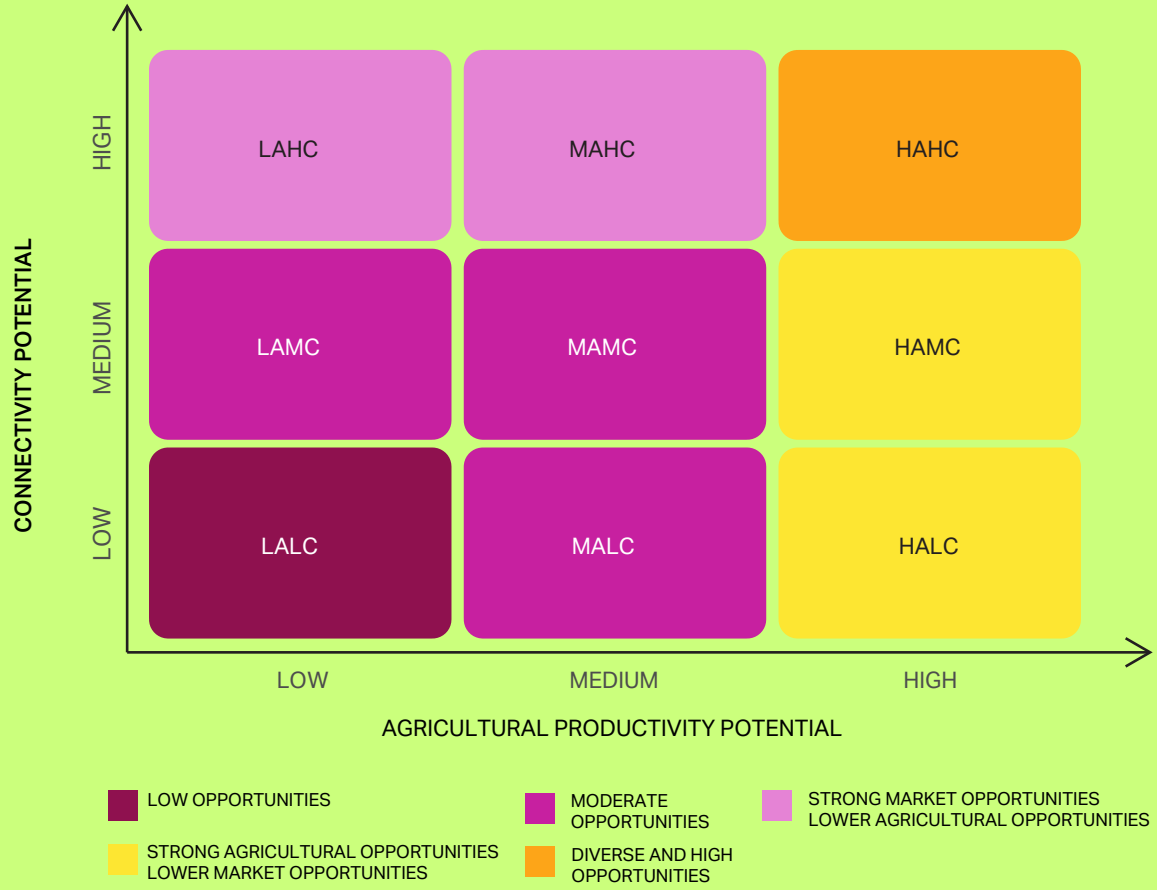
Each of these categories enables a granular understanding of the rural contexts in which rural youth live and work, enabling more tailored and context-sensitive interventions targeting critical constraints (e.g. inadequate infrastructure, low agricultural potential or insufficient digital connectivity) and promoting pathways that help youth thrive in agrifood systems.

l The OpenCellID database is an open-source initiative that provides a representative sample of mobile phone coverage and accessibility. It aggregates cell tower information from various telecommunication network providers, reflecting the coverage areas of each provider. Research has validated the accuracy of OpenCellID data in representing mobile phone coverage when compared to other sources.[20] For more information, visit https://opencellid.org.

m To ensure data quality, observations with fewer than 100 measurements and those with a range exceeding 10 km were excluded. Similarly, only one tower per location was retained when multiple towers were present.8, 9 The coverage area was calculated by creating buffer zones around each cell tower based on the provided range, allowing assessment of the total area covered and the intensity of the signal from overlapping ranges. For spatial analysis, cell towers were matched to a 55×55 km grid, employing a rolling spatial window of 10 km to count the number of towers within each grid cell and its surroundings.8 Finally, the coverage areas were rasterized, assigning a value of 1 to cells covered by any tower and 0 to those that were not, facilitating a comprehensive evaluation of cell tower coverage and signal intensity.8, 10

FIGURE A1.2

TYPOLOGY OF ECONOMIC OPPORTUNITY SPACES WHERE RURAL YOUTH LIVE



Source: Author's own elaboration.

APPENDIX 2 METHODOLOGY FOR GLOBAL ESTIMATES OF EMPLOYMENT IN AGRIFOOD SYSTEMS FOR YOUTH AND ADULTS

To provide the global estimates of employment in agrifood systems for youth and adults, this report adopted a definition developed by Davis *et al.*[1] This definition relies on employment data classified at the two-digit ISIC level to capture agrifood systems-related activities (see Table A2.1). Two ILO data series were used to derive age-disaggregated estimates of employment in agrifood systems:

1. Employment in agriculture by age (ILO modelled estimates, thousands | Annual)[2];
2. Employment by sex, age and economic activity (unpublished special tabulation, ISIC level 2, thousands | Annual).[3]

Agrifood systems employment is divided into agricultural employment and off-farm agrifood systems employment. Agricultural employment is estimated using ILO modelled data to ensure broader country-year coverage. Total agrifood systems employment is calculated as the sum of agricultural and off-farm agrifood systems employment.

To address missing data in off-farm agrifood systems estimates and enhance country-year coverage, a two-step approach was used:

1. **Linear interpolation:** Missing values between existing data points were estimated using linear trend interpolation, provided that at least two observations were available. This step helps to fill temporal gaps in the data
2. **Econometric model:** For country-year pairs where gaps remained after interpolation, an econometric model was constructed to predict the share of youth in off-farm agrifood systems employment. This model incorporates economic conditions and demographic characteristics (Table A2.2). For countries with at least one observed data point, ordinary least squares (OLS) with country fixed effects were used; for countries with any observed data points, a fractional regression model was employed.

TABLE A2.1 AGRIFOOD SYSTEMS ACTIVITIES BASED ON THE UNITED NATIONS INTERNATIONAL STANDARD INDUSTRIAL CLASSIFICATION OF ALL ECONOMIC ACTIVITIES (ISIC) CODES

CATEGORIES	ISIC DIVISIONS	ISIC REV.4 2-DIGIT CODES
AGRICULTURE, FORESTRY AND FISHING	AGRICULTURE	01
	FORESTRY AND LOGGING	02
	FISHING	03
FOOD PROCESSING AND SERVICES	MANUFACTURE OF FOOD PRODUCTS	10
	MANUFACTURE OF BEVERAGES	11
	FOOD AND BEVERAGE SERVICE ACTIVITIES	56
	UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF PRIVATE HOUSEHOLDS FOR OWN USE	98
MANUFACTURE OF NON-FOOD AGRICULTURAL PRODUCTS	MANUFACTURE OF TOBACCO PRODUCTS	12
	MANUFACTURE OF TEXTILES	13
	MANUFACTURE OF LEATHER AND RELATED PRODUCTS	15
	MANUFACTURE OF WOOD AND OF PRODUCTS OF WOOD AND CORK, EXCEPT FURNITURE	16
	MANUFACTURE OF PAPER AND PAPER PRODUCTS	17
TRADE *Agrifood system share estimated	WHOLESALE TRADE, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES	46
	RETAIL TRADE, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES	47
TRANSPORTATION *Agrifood system share estimated	LAND TRANSPORT AND TRANSPORT VIA PIPELINES	49
	WATER TRANSPORT	50
	AIR TRANSPORT	51
	WAREHOUSING AND SUPPORT ACTIVITIES FOR TRANSPORTATION	52
	POSTAL AND COURIER ACTIVITIES	53

Note: The agrifood systems shares in total trade and transport are estimated using a methodology described in Davis, B., Mane, E., Gurbuzer, L.Y., Caivano, G., Piedrahita, N., Schneider, K., Azhar, N. et al. 2023. Estimating global and country-level employment in agrifood systems. FAO Statistics Working Paper Series, No. 23–34. Rome, FAO.

Source: Adapted from FAO. 2023. The status of women in agrifood systems. Rome. https://doi.org/10.4060/cc5343en

TABLE A2.2 LIST OF VARIABLES

	VARIABLES	SOURCE
ECONOMIC CONDITIONS	GDP GROWTH	WORLD DEVELOPMENT INDICATORS
	GDP PER CAPITA	WORLD DEVELOPMENT INDICATORS
	AGRICULTURE, FORESTRY AND FISHING, VALUE ADDED	WORLD DEVELOPMENT INDICATORS
	MOBILE CELLULAR SUBSCRIPTIONS (PER 100 PEOPLE)	INTERNATIONAL TELECOMMUNICATIONS UNION
	INDIVIDUALS USING THE INTERNET (%)	INTERNATIONAL TELECOMMUNICATIONS UNION
	SHARE OF YOUTH WORKERS IN AGRICULTURE	ILO ESTIMATES BASED ON ILO MODELLED ESTIMATES, NOVEMBER 2023
	SHARE OF OFF-FARM AGRIFOOD SYSTEMS EMPLOYMENT IN TOTAL EMPLOYMENT	FAOSTAT AND ILO
DEMOGRAPHIC CHARACTERISTICS	SHARE OF YOUTH NOT IN EMPLOYMENT, EDUCATION OR TRAINING (NEET)	ILO MODELLED ESTIMATES
	SHARE OF YOUTH AMONG PEOPLE AGED 25–64	UNITED NATIONS POPULATION DIVISION
	SHARE OF YOUTH IN THE LABOUR FORCE	ILO MODELLED ESTIMATES
	RURAL POPULATION (% OF TOTAL POPULATION)	WORLD DEVELOPMENT INDICATORS

Source: Author's own elaboration.

TABLE A2.3 COMPARISON OF SUMMARY STATISTICS BETWEEN DEPENDENT VARIABLE AND PREDICTIONS FROM OLS REGRESSION

VARIABLE	NUMBER OF OBSERVATIONS	MEAN	STD. DEVIATION	MIN	MAX
SHARE OF YOUTH IN OFF-FARM AGRIFOOD SYSTEMS	1 296	0.182	0.071	0.014	0.491
PREDICTED VALUES OLS	1 746	0.184	0.064	0.054	0.439

Source: Author's own elaboration.

OLS MODEL FOR COUNTRIES WITH AT LEAST ONE DATA POINT

An OLS model was estimated with country and year fixed effects to control for unobserved heterogeneity. Country fixed effects account for time-invariant characteristics such as policies or cultural norms, while year fixed effects control for common macroeconomic shocks affecting all countries in a given year.

Although OLS does not restrict predictions to within a range of [0,1], the summary statistics (Table A2.3) show that all predicted values fall within this range. While fractional regression is typically preferred for modelling fractions due to its bounded nature, it does not allow for country fixed effects. Papke and Wooldridge[4] extended their 1996 fractional regression approach by incorporating the Mundlak[5] and Chamberlain[6] corrections to account for unobserved effects in panel data. However, this method requires a balanced panel, which limits its applicability for the present report. Therefore, an OLS with country fixed effects was adopted for countries with observed data.

The OLS regression is specified as follows:

$$y_{itf} = \beta_0 + \beta_1 X_{it} + \delta_i + \gamma_t + \mu_{it}$$

Where

$$y_{itf} = \frac{off-farm\ AFS_{ity}}{off-farm\ AFS_{ity} + off-farm\ AFS_{ita}};\ y_{itf} \in [0,1]$$

is the share of youth employed in off-farm agrifood systems out of all people employed in off-farm agrifood systems in country *i* in year *t*.

χ_{it} is the set of control variables mentioned above

γ_t refers to year fixed effects

δi refers to country fixed effects

Table A2.3 shows that the model performs reasonably well in predicting the share of youth in off-farm agrifood systems employment, as indicated by the close mean values, similar range, and variance between the observed data and the predicted values. Moreover, the distributions of the real and predicted values, depicted in Figure A2.1, show that the distribution behaves relatively well in comparison to the "real" data including around the mean and tails of the distribution.

FRACTIONAL MODEL FOR COUNTRIES WITHOUT ANY DATA

To estimate the share of youth in off-farm agrifood systems employment for countries without any data, a fractional regression model with a probit link function was used with dummy variables for the various subregions and agrifood systems typologies.

$$E(y_{it}|x_{it}, \gamma t, \delta_i) = \phi(x_{it}\beta, \gamma_t, \delta_i, \phi_i)$$

Where

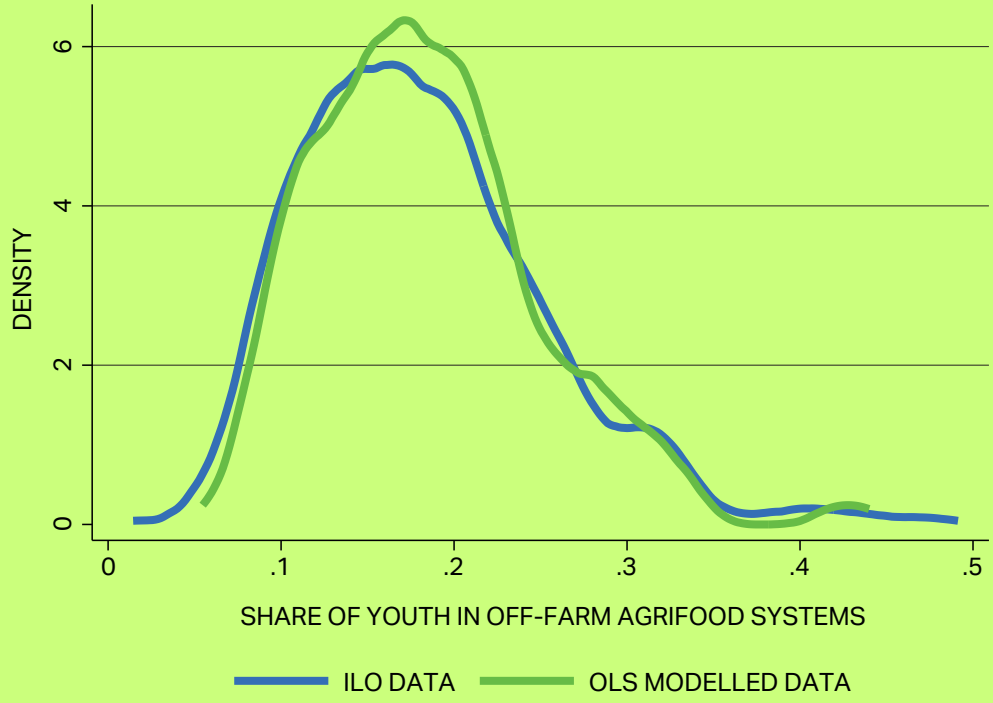
δ_i reflects the subregional dummy variables

Φ_i reflects the agrifood system typologies

To assess model performance, the fractional regression was compared to an OLS regression using an R squared-like measure based on squared errors, which is comparable to the R squared from OLS. Along with this R squared-like measure, for the in-sample assessment,

FIGURE A2.1

KERNEL DENSITY COMPARISON BETWEEN DEPENDENT VARIABLE AND PREDICTIONS FROM OLS REGRESSION



Source: Author's own elaboration.

a Mean Squared Error (MSE) was calculated using all observed data points to evaluate each model's fit with the existing data. The in-sample MSE provides an insight into how well the model captures patterns within the sample. To assess out-of-sample performance, the out-of-sample MSE was estimated by splitting the data into training and test sets. The model was run on the training dataset and the MSE was calculated based on the test set. The out-of-sample MSE reveals the model's predictive accuracy on unseen data. An estimation was also made of the out-of-sample R squared. Table A2.4 shows that the fraction model has higher in sample and out-of-sample R-squares and lower MSEs.

Figure A2.2 depicts the completeness of the panel after predicting $\hat{y}_{itf}$. After the various data imputation procedures, the final dataset comprised the share of youth in agrifood systems for 134 countries from 2005 to 2021, and a further 32 countries for which an incomplete time series was available. For 2021, it was possible to estimate the share of youth in agrifood systems for 153 countries, representing 97 percent of the youth population worldwide.

After predicting $\hat{y}_{iyt}$, the share of adults in the off-farm segment of agrifood systems employment was estimated as $\hat{y}_{ita} = 1\text{-}\hat{y}_{ity}$. The number of youth and adults employed in off-farm agrifood systems was then calculated by multiplying $\hat{y}_{ita}$ and $\hat{y}_{ity}$ by the number of people employed in off-farm agrifood systems estimated in FAOSTAT.[7]

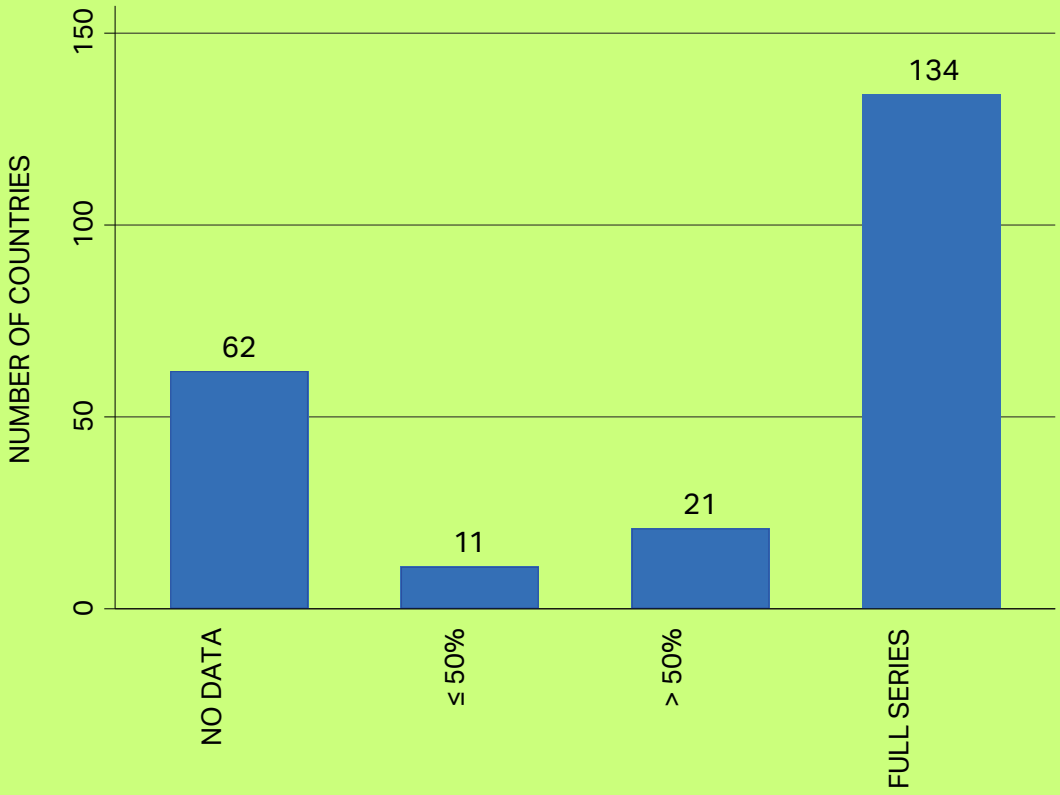
TABLE A2.4 CROSS-VALIDATION FRACTIONAL VS. OLS

	WITHIN SAMPLE		OUT-OF-SAMPLE	
	R SQUARED	MSE	R SQUARED	MSE
OLS MODEL	0.727	0.00133	0.69	0.00131
FRACTIONAL	0.789	0.00129	0.70	0.00127

Source: Author's own elaboration.

FIGURE A2.2

NUMBER OF COUNTRIES BY DATA AVAILABILITY AFTER MODELLING FROM 2005 TO 2021



Source: Author's own elaboration.

APPENDIX 3
SURVEY DATA: DATA SOURCES, DEFINITIONS OF VARIABLES AND METHODOLOGY

This appendix presents the survey data used in Chapter 4 and details the definitions of variables used in this chapter, including the full-time equivalents and the intergenerational mobility probabilities, and how these were constructed.

MICRODATA SOURCES AND SURVEYS

This chapter uses microdata shared from Davis *et al.*[1] and builds on data from the Rural Livelihoods Information System (RuLIS).[2] More specifically, these data use national representative household surveys from up to 18 countries.[2] Table A3.1 shows the different surveys used for the different analyses in this chapter.

COMPUTING FULL-TIME EQUIVALENTS

Beside the binary employment and engagement variables, full-time equivalents were computed for individuals aged 15 and above, using five surveys from Malawi, Nigeria, Peru, the United Republic of Tanzania and Uganda (see Figure 4.12 and Table A3.1). Full-time equivalents, calculated over a 12-month recall period, can provide a more complete picture of engagement in labour markets,[3, 4] accounting also for seasonality of work in agriculture and agrifood systems in general. It also enables comparison of time spent by different individuals across different sectors, functional categories and contexts.[3]

In the five countries, the time worked by each individual in different sectors and types of jobs was computed, using information from the respective agriculture, employment and, whenever applicable, non-farm enterprises modules of the surveys. Adapting an approach from IFAD's *2019 Rural Development Report*,[3] full-time equivalents were computed for the time worked in seven categories, including (1) on the household farm, (2) in agricultural self-employment, (3) in agricultural wage employment, (4) in off-farm agrifood systems self-employment, (5) in off-farm agrifood systems wage employment, (6) in non-agrifood systems self-employment, and (7) in non-agrifood systems wage employment. The classification of ISIC codes employed by Davis *et al.*[1] was used to allocate the different jobs to the different sectors of agrifood systems or outside agrifood systems. Table A3.2 below provides more information on the different sources of information used to compute the total number of hours worked in each sector.

TABLE A3.1 LIST OF SURVEYS

COUNTRY	YEAR(S)	SURVEY	FIGURES IN CHAPTER 4
BENIN	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
BOLIVIA (PLURINATIONAL STATE OF)	2008	ENCUESTA DE LOS HOGARES	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
BURKINA FASO	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
GEORGIA	2013	INTEGRATED HOUSEHOLD SURVEY	FIG. A (SPOTLIGHT 4.1), FIG. 4.14
	2016		FIG. 4.11, FIG. 4.13, FIG. 4.14
GUATEMALA	2014	ENCUESTA NACIONAL DE CONDICIONES DE VIDA	FIG. 4.11, FIG. 4.13, FIG. 4.14 FIG. A (SPOTLIGHT 4.1)
GUINEA-BISSAU	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
CÔTE D'IVOIRE	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
MALAWI	2013	INTEGRATED HOUSEHOLD SURVEY	FIG. 4.14
	2017		FIG. 4.13, FIG. 4.14
	2020		FIG. 4.12, FIG. A (SPOTLIGHT 4.1)
MALI	2014	ENQUÊTE AGRICOLE DE CONJONCTURE INTÉGRÉE 2014	FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14
MOZAMBIQUE	2009	INQUÉRITO SOBRE ORÇAMENTO FAMILIAR	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)

TABLE A3.1 LIST OF SURVEYS

COUNTRY	YEAR(S)	SURVEY	FIGURES IN CHAPTER 4
NIGER	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
NIGERIA	2013	GENERAL HOUSEHOLD SURVEY	FIG. 4.11, FIG. 4.14
	2016		FIG. 4.12, FIG. 4.13, FIG. A (SPOTLIGHT 4.1)
	2014		FIG. 4.14
	2019		FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
PERU	2014	ENCUESTA NACIONAL DE HOGARES	FIG. 4.14
	2019		FIG. 4.11, FIG. 4.12, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
SENEGAL	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
SIERRA LEONE	2018	INTEGRATED HOUSEHOLD SURVEY	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
TOGO	2019	ENQUÊTE HARMONISÉE SUR LES CONDITIONS DE VIE DES MÉNAGES (EHCVM)	FIG. 4.11, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
UNITED REPUBLIC OF TANZANIA	2015	NATIONAL PANEL SURVEY	FIG. 4.12, FIG. 4.13, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
UGANDA	2011	THE UGANDA NATIONAL PANEL SURVEY	FIG. 4.14
	2016		FIG. 4.12, FIG. 4.14, FIG. A (SPOTLIGHT 4.1)
	2020		FIG. 4.11, FIG. 4.13, FIG. 4.14

Source: Author's own elaboration adapting the list of surveys from Davis *et al.*[1]

To compute the full-time equivalents, the total amount worked in each category over the 12-month recall period was computed in Malawi, Nigeria, the United Republic of Tanzania and Uganda. In Peru, the information was available on a weekly basis. For each category, the total amount of time worked was converted to full-time equivalents. Following IFAD's 2019 Rural Development Report, the total workload and schedule over a year was estimated at 2 016 hours (12 months per year, 4.3 weeks per month and 40 hours per week).[3] Full-time equivalents were obtained by dividing the total hours worked in each sector and type of employment by 2 016 (or 40 hours in the case of Peru). Full-time equivalents below and above 1 represent a situation of underemployment and overemployment, respectively.[3]

ASSESSING INTERGENERATIONAL MOBILITY

As countries develop and agrifood systems evolve, labour productivity expands, and greater agrifood systems output is achieved with a falling share of the labour force employed in agrifood activities. This transformation is also characterized by a rising share of the labour force participating in higher-paying sectors, mostly outside agriculture. Such processes can also happen over generations, leading to intergenerational economic migration between sectors – an expected outcome of expanding countries and their agrifood systems.

The analyses presented in Figures 4.13 and Figure 4.14 emphasize such intergenerational economic sectoral migration. Inspired by the indicator of intergenerational mobility developed by Alesina *et al.*,[5] this analysis examines the probability of younger cohorts (20–24 years old) being employed outside agriculture or the agrifood systems sector, while their parents are employed in either primary agriculture or agrifood systems employment more broadly. The focus on the 20–24 age cohort is linked to the fact that analyses examine intergenerational economic sector mobility, which would not be a sensible indicator for younger cohorts that have not fully entered the labour force.

This analysis also focuses on upward mobility, that is, youth aged 20–24 who work outside agrifood systems while their parents work in agriculture or broader agrifood systems. Adapting the approach from Alesina *et al.*, 2021[5] a binary variable of upward intergenerational sector mobility is constructed as follows:

- IM_up_i equals 1 if a youth *i* aged 20-24 works outside agrifood systems, given that their parents are working in agriculture or agrifood systems, and 0 otherwise.

The approach focused on a measure of absolute intergenerational mobility,[5] reflecting youth's likelihood of working in a different sector than their parents. For each country, the likelihood of intergenerational mobility is computed for all youth whose parents work in agriculture or agrifood systems. The analysis is also disaggregated by gender (Figure 4.14) by computing these likelihoods separately for young women and young men.

TABLE A3.2 INFORMATION USED TO COMPUTE THE TOTAL AMOUNT OF HOURS WORKED IN EACH SECTOR AND TYPE OF JOBS

COUNTRY	YEAR	SURVEY	SOURCE OF INFORMATION		
			AGRICULTURAL MODULE	EMPLOYMENT MODULE	NON-FARM ENTERPRISE MODULE
MALAWI	2020	INTEGRATED HOUSEHOLD SURVEY	■ HOUSEHOLD FARMING (12-MONTH RECALL)	■ FIRST AND SECOND WAGE JOBS (12-MONTH RECALL) ■ GANYU WORK (12-MONTH RECALL)	■ WORK IN HOUSEHOLD ENTERPRISE (12-MONTH RECALL)
NIGERIA	2016	GENERAL HOUSEHOLD SURVEY	■ HOUSEHOLD FARMING (12-MONTH RECALL)	■ FIRST AND SECOND WAGE JOBS (12-MONTH RECALL)	■ WORK IN HOUSEHOLD ENTERPRISE (12-MONTH RECALL)
PERU	2019	ENCUESTA NACIONAL DE HOGARES	■ HOUSEHOLD FARMING (7-DAY RECALL)	■ FIRST AND SECOND JOBS (7-DAY RECALL)	N/A
UNITED REPUBLIC OF TANZANIA	2015	NATIONAL PANEL SURVEY	■ HOUSEHOLD FARMING (12-MONTH RECALL)	■ FIRST AND SECOND WAGE JOBS (12-MONTH RECALL)	■ WORK IN HOUSEHOLD ENTERPRISE (12-MONTH RECALL)
UGANDA	2016	THE UGANDA NATIONAL PANEL SURVEY	■ HOUSEHOLD FARMING (12-MONTH RECALL)	■ FIRST TO FOURTH JOBS (12-MONTH RECALL)	■ WORK IN HOUSEHOLD ENTERPRISE (12-MONTH RECALL)

Source: Author's own elaboration.

APPENDIX 4 METHODOLOGY TO ESTIMATE THE BENEFITS OF ELIMINATING YOUTH UNEMPLOYMENT

This appendix outlines the methodology used to estimate the potential impact on gross domestic product (GDP) of eliminating youth unemployment and creating employment opportunities for youth aged 20–24 who are currently not in employment, education or training (NEET). This analysis also assesses the specific contribution of agrifood systems under this scenario, both in terms of GDP growth and the number of jobs generated.

This approach builds on the share of youth employment in agrifood systems presented in Chapter 4, combined with data on the share of youth who are outside the labour force or classified as NEET, based on ILO modelled estimates. The estimations are calculated for the whole world as well as for each region separately. The results show that eliminating youth unemployment and providing employment opportunities for youth aged 20–24 who are currently NEET would increase global GDP by 1.4 percent, or USD 1.5 trillion (Table A4.1). In terms of the contribution of agrifood systems, agrifood systems employment would provide an additional 87 million jobs for unemployed and NEET youth (Table A4.2) and contribute 45 percent of the estimated GDP increase, corresponding to USD 680 billion (Table A4.1).

ESTIMATED MODEL

Assuming that national GDP is defined by an aggregate production function, $F(K,L)$, GDP can be defined as:

$$(1)\quad Y = F(K,L).$$

The effect of increasing employment in GDP would be:

$$dY = \frac{\partial F(K,L)}{\partial L} \cdot dL,$$

or in percentage terms, the effect of increasing labour can be approximated as:

$$(2)\quad \Delta \ln Y \approx \frac{\partial \ln Y}{\partial \ln L} \cdot \Delta \ln L \equiv \varepsilon_L \cdot \Delta \ln L.$$

The aim here is to focus on the 15–24 year-old cohort. In terms of activity, the total population cohort can be classified as (N_{15-24}):

$$N_{15-24} = L_{15-24} + O_{15-24}.$$

Those that are in the labour force are classified as (L_{15-24}), and those who do not participate in the labour force as O_{15-24}. In turn, each group can be further divided: those in the labour force can either work L^L_{15-24}, or be currently unemployed, L^U_{15-24}.Similarly, those out of the labour force can either be in school O^S_{15-24}, or out of education and the labour force O^N_{15-24}. Hence, the youth cohort can be classified by activity, as follows:

$$(3)\quad N_{15-24} = L^L_{15-24} + L^U_{15-24} + O^S_{15-24} + O^N_{15-24}.$$

If youth unemployment was eliminated, then the labour force would grow, $\Delta \ln L \approx L^U_{15-24}/L$, and following the relationship shown in (2), the impact on GDP growth of eliminating this form of unemployment can be approximated. However, this would lead to an

overestimation of the impact of youth labour on GDP, because younger workers are less productive. However, if the approximate wage gap between the young and the labour force is known, it is possible to adjust the elasticity. Note that:

$$(4)\quad \varepsilon_L \equiv \frac{\partial F(K,L)}{\partial L}\cdot\frac{\mathrm{L}}{Y}.$$

Given that the marginal product in (4) under market conditions is equal to the wages, it is easy to show that:

$$(5)\quad \frac{\varepsilon_L^{15-24}}{\varepsilon_L} = \frac{w_{15-24}}{w}.$$

Thus, knowing the youth wage gap, it is possible to approximate the impact of eliminating youth unemployment on GDP, transforming slightly (2):

$$(6)\quad \Delta \ln Y \approx \varepsilon_L \cdot \left(\frac{\varepsilon_L^{15-24}}{\varepsilon_L}\right) \cdot \Delta \ln L.$$

Furthermore, not all youth employment goes to the agrifood sector. Given that youth employment can be divided into agrifood systems and non-agrifood systems employment:

$$L_{15-24}^{L} = L_{15-24}^{AFS} + L_{15-24}^{NAFS},$$

then a portion $\frac{L_{15-24}^{AFS}}{L_{15-24}^{L}}$, of the employed would participate in agrifood systems, if employment sector shares remain constant.

The number of jobs in agrifood systems, should youth unemployment be eliminated, is computed by multiplying the share of youth employed in agrifood systems, globally and in each region, by the corresponding number of unemployed youth (15–24) and youth that are NEET (20–24), reflecting the current labour markets sectoral composition (Table A4.2).

TABLE A4.1 IMPACT OF ELIMINATING YOUTH UNEMPLOYMENT ON GROSS DOMESTIC PRODUCT

					EFFECTS ON GDP $\Delta \ln Y$			AGRIFOOD SYSTEMS CONTRIBUTION $\Delta \ln Y$			
	ε_L^1	$\frac{L_{15-24}^{U}}{L}^3$	$\frac{\varepsilon_L^{15-24}}{\varepsilon_L}^2$	$\frac{O_{20-24}^{N}}{L}^3$	Eliminating Youth Unemployment	Providing employment to Youth NEET	TOTAL	$\frac{L_{15-24}^{AFS}}{L_{15-24}^{L}}^3$	Eliminating Youth Unemployment	Providing employment to Youth NEET	TOTAL
CENTRAL ASIA	0.263	0.876	0.019	0.127	0.44	2.93	3.37	0.41	0.18	1.20	1.38
EASTERN ASIA	0.463	0.909	0.003	0.013	0.12	0.53	0.65	0.27	0.03	0.14	0.18
EUROPE AND NORTHERN AMERICA	0.547	0.576	0.012	0.010	0.37	0.33	0.70	0.24	0.09	0.08	0.17
LATIN AMERICA AND THE CARIBBEAN	0.390	0.656	0.019	0.028	0.50	0.71	1.20	0.38	0.19	0.27	0.46
NORTHERN AFRICA	0.288	0.797	0.025	0.107	0.57	2.46	3.03	0.43	0.24	1.06	1.30
OCEANIA	0.529	0.654	0.014	0.031	0.49	1.06	1.55	0.36	0.18	0.38	0.56
SOUTHEASTERN ASIA	0.393	0.766	0.012	0.027	0.36	0.82	1.18	0.45	0.16	0.37	0.53
SOUTHERN ASIA	0.333	0.621	0.019	0.053	0.39	1.10	1.49	0.51	0.20	0.56	0.76
SUB-SAHARAN AFRICA	0.307	0.562	0.017	0.038	0.29	0.66	0.95	0.68	0.20	0.45	0.65
WESTERN ASIA	0.343	0.680	0.043	0.081	1.01	1.88	2.90	0.31	0.31	0.58	0.90
TOTAL	0.408	0.636	0.017	0.036	0.43	0.94	1.37	0.45	0.19	0.42	0.62

Source: Author's own elaboration.

TABLE A4.2 NUMBER OF JOBS CREATED IN AGRIFOOD SYSTEMS TO ELIMINATE YOUTH UNEMPLOYMENT

	$\frac{L^{U}_{15-24}}{L}$ [3]	$\frac{O^{N}_{20-24}}{L}$ [3]	$\frac{L^{AFS}_{15-24}}{L^{L}_{15-24}}$ [4]	Total labour force (in millions)	Youth 15–24 unemployed (in millions)	Youth NEET (in millions)	Number of jobs in agrifood systems for youth 15–25 (in millions)
CENTRAL ASIA	0.019	0.127	0.41	32.27	0.61	4.10	1.93
EASTERN ASIA	0.003	0.013	0.27	915.21	2.75	11.90	3.82
EUROPE AND NORTHERN AMERICA	0.012	0.010	0.24	317.65	6.04	8.89	5.68
LATIN AMERICA AND THE CARIBBEAN	0.019	0.028	0.38	65.69	1.64	7.03	3.72
NORTHERN AFRICA	0.025	0.107	0.43	550.65	6.61	5.51	2.93
OCEANIA	0.014	0.031	0.36	22.42	0.31	0.69	0.36
SOUTHEASTERN ASIA	0.012	0.027	0.45	347.35	4.17	9.38	6.12
SOUTHERN ASIA	0.019	0.053	0.51	801.92	15.24	42.50	29.53
SUB-SAHARN AFRICA	0.017	0.038	0.68	500.77	8.51	19.03	18.75
WESTERN ASIA	0.043	0.081	0.31	112.08	4.82	9.08	4.31
TOTAL	**0.017**	**0.036**	**0.45**	**3666.01**	**62.32**	**131.98**	**87.06**

Source: Author´s own elaboration.

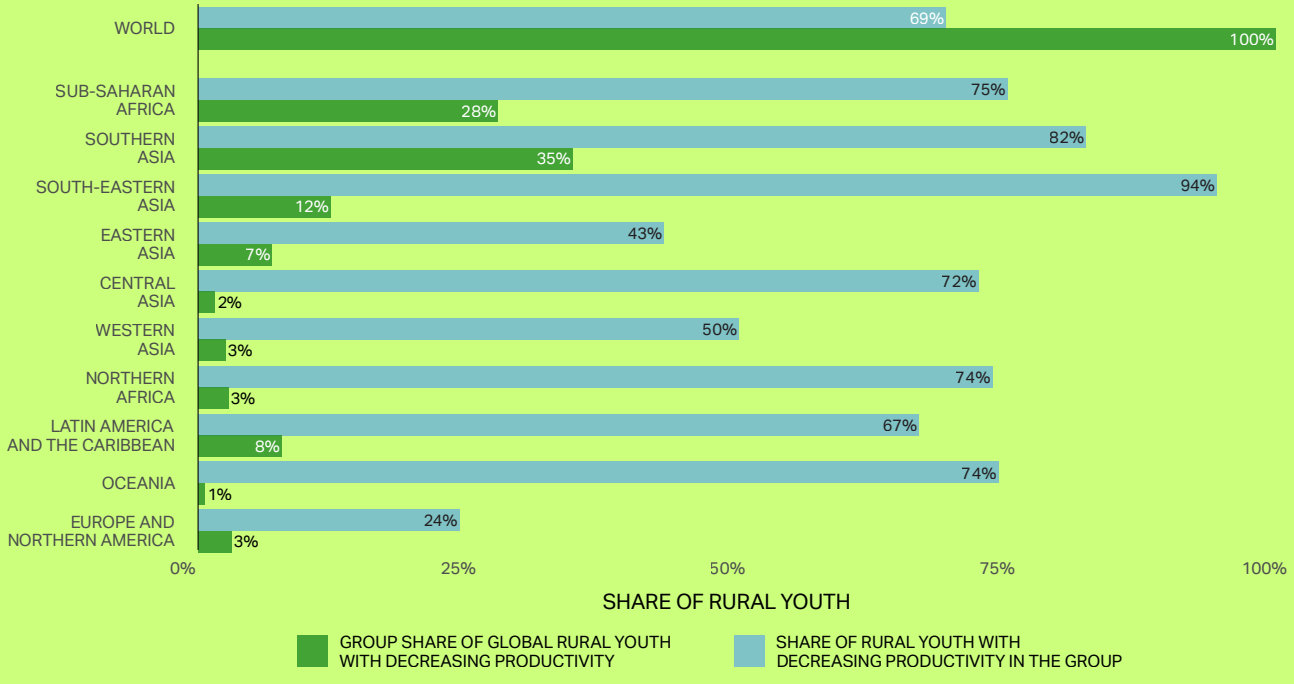
1. Obtained from the wage bill, from the UN National Accounts database https://unstats.un.org/unsd/nationalaccount/data.asp.
2. Computed based on data from ILO Harmonized Microdata using the indicator "Average hourly earnings of employees by sex and age – Annual" (https://ilostat.ilo.org).
3. The shares of youth unemployed and NEET were computed based on annual data from the ILO Harmonized Microdata https://ilostat.ilo.org) and YouthSTATS databases.
4. As reported in Chapter 4. Own elaboration, using ILO estimates based on ILO modelled estimates, November 2023.

APPENDIX 5 ADDITIONAL FIGURES AND TABLES

CHAPTER 2

FIGURE A5.1

REGIONAL DISTRIBUTION OF RURAL YOUTH LIVING IN AREAS WITH EXPECTED DECLINING PRODUCTIVITY FROM CLIMATE CHANGE

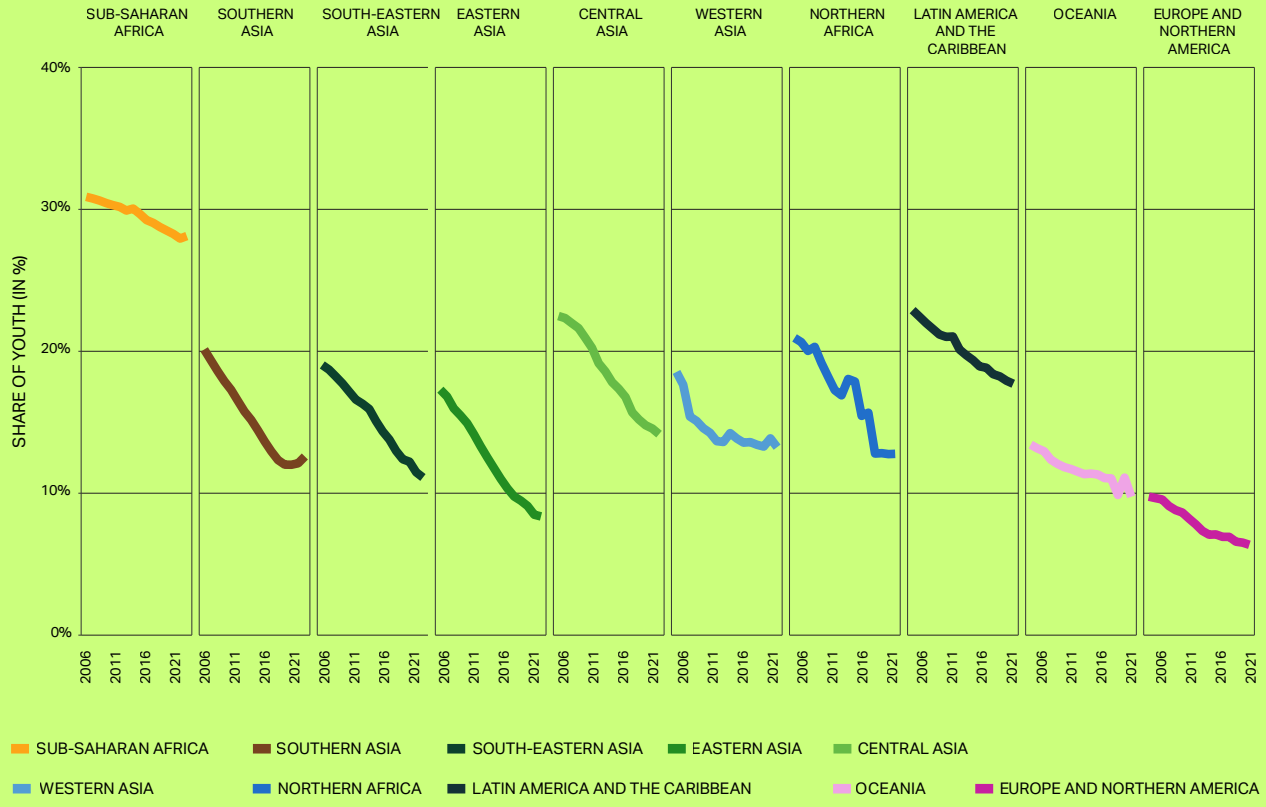


Source: Authors' own elaboration based on population count estimates for 2020 from WorldPop (www.worldpop.org – School of Geography and Environmental Science, University of Southampton; the Department of Geography and Geosciences, University of Louisville; the Departement de Geographie, Universite de Namur); the Center for International Earth Science Information Network (CIESIN), Columbia University. 2018. Global High Resolution Population Denominators Project, funded by the Bill and Melinda Gates Foundation (OPP1134076) (https://dx.doi.org/10.5258/SOTON/WP00647); Cattaneo, Nelson and McMenomy. 2020. Urban-rural continuum. figshare. Dataset (https://doi.org/10.6084/m9.figshare.12579572.v4).

CHAPTER 4

FIGURE A5.2

SHARE OF YOUTH OUT OF ALL WORKERS IN AGRICULTURE HAS DECLINED IN ALL REGIONS SINCE 2005



Note: Graph based on data from 134 countries: *Sub-Saharan Africa*: Burundi, Benin, Burkina Faso, Botswana, Cape Verde, Comoros, Côte d'Ivoire, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Swaziland, Tanzania (United Republic of), Togo, Uganda, Zambia, Zimbabwe. *Southern Asia*: Afghanistan, Bangladesh, India, Iran (Islamic Republic of), Nepal, Pakistan, Sri Lanka. *Southeastern Asia*: Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam. *Eastern Asia*: China, Japan, Korea (Republic of), Mongolia. Central Asia: Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan. *Western Asia*: Azerbaijan, Cyprus, Georgia, Iraq, Israel, Jordan, Lebanon, Oman, Palestine, Saudi Arabia, Türkiye, United Arab Emirates. *Northern Africa*: Algeria, Egypt, Morocco, Tunisia. *Latin America and the Caribbean*: Argentina, Bahamas, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay. *Oceania*: Australia, Fiji, New Zealand. *Europe and northern America*: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Denmark, Germany, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova (Republic of), Netherlands (Kingdom of the), North Macedonia, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America.

Source: Author's own elaboration using ILO estimates based on ILO modelled estimates, November 2023.

TABLE A5.1 SHARE OF YOUTH OUT OF ALL WORKERS IN AGRICULTURE IN SELECTED COUNTRIES

AGRIFOOD SYSTEM TYPE	COUNTRY	SHARE OF YOUTH AMONG ALL AGRICULTURAL WORKERS (IN %)		CHANGE (IN %)
		2012	2021	
PROTRACTED CRISIS	ETHIOPIA	30.5	25.6	-16%
	PALESTINE	23.4	20.5	-12%
	SUDAN	21.8	30.7	41%
	ZIMBABWE	33.8	27.7	-18%
TRADITIONAL	BANGLADESH	20.9	18.1	-13%
	CAMBODIA	26.9	16.3	-39%
	INDIA	14.8	9.9	-33%
	LAO PEOPLE'S DEMOCRATIC REPUBLIC	25.9	23.2	-10%
	MADAGASCAR	31.9	30.8	-4%
	PAKISTAN	26.1	25.6	-2%
	PAPUA NEW GUINEA	24.7	22.7	-8%
	SENEGAL	27.9	28.6	3%
	TIMOR-LESTE	15.1	13.6	-10%
	TOGO	14.4	15.4	7%
	UGANDA	31.8	36.1	14%
	ANGOLA	21.9	29.3	34%
EXPANDING	BOLIVIA (PLURINATIONAL STATE OF)	21.1	18.4	-13%
	BOTSWANA	16.7	11.6	-31%
	EGYPT	19.2	17.4	-9%
	EL SALVADOR	28.1	20.6	-27%
	GAMBIA	29.5	29.0	-2%
	GEORGIA	7.6	3.9	-48%
	GUATEMALA	32.5	27.9	-14%
	HONDURAS	32.1	26.9	-16%
	KYRGYZSTAN	26.1	23.4	-10%
	PERU	23.1	18.8	-19%
	SAMOA	20.1	18.2	-9%
	SRI LANKA	7.7	4.3	-44%
	THAILAND	8.2	7.9	-4%
	VIET NAM	14.5	8.8	-39%
	ARMENIA	11.0	6.3	-43%

TABLE A5.1 SHARE OF YOUTH OUT OF ALL WORKERS IN AGRICULTURE IN SELECTED COUNTRIES

AGRIFOOD SYSTEM TYPE	COUNTRY	SHARE OF YOUTH AMONG ALL AGRICULTURAL WORKERS (IN %)		CHANGE (IN %)
		2012	2021	
DIVERSIFYING	BOSNIA AND HERZEGOVINA	4.5	4.9	10%
	ECUADOR	19.0	21.9	15%
	IRAN (ISLAMIC REPUBLIC OF)	15.5	7.4	-52%
	MEXICO	22.0	17.8	-19%
	PANAMA	20.8	20.9	1%
	SOUTH AFRICA	11.4	8.3	-27%
FORMALIZING	ALBANIA	10.5	10.5	0%
	ARGENTINA	16.2	14.2	-12%
	COSTA RICA	16.8	11.1	-34%
	DOMINICAN REPUBLIC	17.8	11.8	-34%
	MONGOLIA	14.3	11.0	-23%
	NORTH MACEDONIA	10.8	4.7	-56%
	PORTUGAL	2.2	4.5	107%
	TÜRKIYE	12.8	14.1	11%
INDUSTRIAL	AUSTRALIA	6.9	8.0	16%
	AUSTRIA	7.6	6.1	-20%
	CZECHIA	4.9	5.8	20%
	FRANCE	6.5	9.5	47%
	GREECE	3.5	2.5	-28%
	JAPAN	2.5	2.7	7%
	SWITZERLAND	10.0	8.0	-20%
	UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND	9.7	11.4	17%

Source: Author's own elaboration based on ILO Harmonized Microdata. https://ilostat.ilo.org

TABLE A5.2 YOUTH HAVE HIGHER DAILY DIETARY ENERGE NEEDS THAN OTHER GROUPS DUE TO RAPID PHYSICAL GROWTH AND ACTIVITY

	MALE			FEMALE[1]		
AGE (YEARS)	SEDENTARY[2]	MODERATELY ACTIVE[3]	ACTIVE[4]	SEDENTARY[2]	MODERATELY ACTIVE[3]	ACTIVE[4]
2	1 000	1 000	1 000	1 000	1 000	1 000
3	1 000	1 400	1 400	1 000	1 200	1 400
4	1 200	1 400	1 600	1 200	1 400	1 400
5	1 200	1 400	1 600	1 200	1 400	1 600
6	1 400	1 600	1 800	1 200	1 400	1 600
7	1 400	1 600	1 800	1 200	1 600	1 800
8	1 400	1 600	2 000	1 400	1 600	1 800
9	1 600	1 800	2 000	1 400	1 600	1 800
10	1 600	1 800	2 200	1 400	1 800	2 000
11	1 800	2 000	2 200	1 600	1 800	2 000
12	1 800	2 200	2 400	1 600	2 000	2 200
13	2 000	2 200	2 600	1 600	2 000	2 200
14	2 000	2 400	2 800	1 800	2 000	2 400
15	2 200	2 600	3 000	1 800	2 000	2 400
16	2 400	2 800	3 200	1 800	2 000	2 400
17	2 400	2 800	3 200	1 800	2 000	2 400
18	2 400	2 800	3 200	1 800	2 000	2 400
19–20	2 600	2 800	3 000	2 000	2 200	2 400
21–25	2 400	2 800	3 000	2 000	2 200	2 400
26–30	2 400	2 600	3 000	1 800	2 000	2 400
31–35	2 400	2 600	3 000	1 800	2 000	2 200
36–40	2 400	2 600	2 800	1 800	2 000	2 200
41–45	2 200	2 600	2 800	1 800	2 000	2 200
46–50	2 200	2 400	2 800	1 800	2 000	2 200
51–55	2 200	2 400	2 800	1 600	1 800	2 000
56–60	2 200	2 400	2 600	1 600	1 800	2 000
61–65	2 000	2 200	2 600	1 600	1 800	2 000
66–70	2 000	2 200	2 600	1 600	1 800	2 000
71–75	2 000	2 200	2 600	1 600	1 800	2 000
≥76	2 000	2 200	2 400	1 600	1 800	2 000

Notes: Estimated energy needs for youth (aged 15–24 years) are shaded in green for males and orange for lifestyle that includes only the physical activity of independent living. Moderately active[3] means a lifestyle that includes physical activity equivalent to walking 1.5–3 miles per day at a speed of 3–4 miles per hour, in addition to activities of independent living. Active[4] means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at a speed of 3–4 miles per hour, in addition to activities of independent living.

Source: Adapted from Institute of Medicine (US) Panel on Micronutrients. 2001. *Dietary reference intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc.* Washington, DC, National Academies Press.
www.ncbi.nlm.nih.gov/books/NBK222310

© FAO/MUNIR UZ ZAMAN
A LIVESTOCK FARMER
IN SARANKHOLA,
BANGLADESH.

GLOSSARY

AGE COHORTS

Although the age brackets defining youth differ considerably across countries and regions, this report adopts the United Nations definition of individuals between the ages of 15 and 24. However, where data sources use alternative age cohorts, the corresponding figures reflect those definitions, with explanations provided in the relevant contexts. Individuals below the age of 18 are legally children. When turning 18, individuals reach legal age and are considered adults. As such, the 15–24 age range captures the upper range of children and the lower range of adults.

- Adolescent: 10–19 years
- Youth: 15–24 years
- Younger youth: 15–17 years
- Older youth: 18–24 years
- Adults: 25 years and above
- Younger adults: 25–34 years
- Older adults: 35 years and above

AGRIFOOD SYSTEMS

Agrifood systems comprise the entire range of actors and interlinked activities that add value in agricultural production and related off-farm activities such as food storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal and consumption. Agricultural production refers to primary crop, livestock, fisheries and forestry production.[1]

AGRICULTURAL, RURAL AND STRUCTURAL TRANSFORMATION

The process by which low-income societies, in which agriculture absorbs most labour and generates most economic output, become high-income societies characterized by a relatively smaller but more productive agricultural sector. Structural transformation involves the reallocation of economic activities away from agriculture and natural resources to industry and services, expanded domestic and international trade, increased specialization and division of labour, and increased rural-urban migration. It also includes the urbanization of the countryside, combined with a reduction in birth rates and a greater participation of youth in the workforce. Agricultural transformation is both a cause and effect of structural transformation – involving productivity increases in agriculture and a shift from subsistence farming to commercial, highly diversified production systems and value chains. Rural transformation captures all aspects of agricultural transformation and also includes the emergence of livelihood and income-generating opportunities in the rural, non-farm sector.[1]

AGRIFOOD SYSTEMS TRANSFORMATION

The process representing the normative change sought in agrifood systems, around a vision balancing sustainability, healthy diets, inclusion and decent livelihoods.

AGRIFOOD SYSTEMS TRANSITION

The process by which agrifood systems change through various shifts – for example, in practices, technologies or market dynamics from traditional to more modern, formalized and industrialized agrifood systems. This transition is not strictly linear and is reflected in different categories of agrifood systems, each with their specific status, challenges and opportunities in terms of sustainability, nutrition and inclusion.

AGRIFOOD SYSTEMS TYPOLOGY

This report adopts the agrifood systems typology developed by Marshall *et al.* [2] and extended in *The State of Food and Agriculture 2024*.[3] The typology classifies countries using measures of productivity, dietary diversity, urbanization and modern retail infrastructure coverage

to assess the degree of agrifood systems transition, with a separate category for countries in protracted crisis, producing six categories: 1) Protracted Crisis, 2) Traditional, 3) Expanding, 4) Diversifying, 5) Formalizing and 6) Industrial.[2] These six agrifood systems categories do not suggest a linear progression from a "less desirable" traditional state to a "fully desirable" industrial state; rather, they serve to indicate where countries are situated along this agrifood systems transition.

AGRIPRENEURS

Individuals who establish and manage enterprises within agrifood systems by identifying business opportunities across the value chain, aiming to generate profit and returns on investment.[4,5]

ECONOMIC OPPORTUNITY SPACE (FOR YOUTH)

The set of viable economic opportunities that young people can harness to improve their livelihoods. These opportunities have strong spatial dimensions, reflecting variations in the structure of agrifood systems and the degree of rural and structural transformation within the country and local areas where youth reside. Youth opportunities may vary across rural areas within a given country, influenced by biophysical and socioeconomic context. Economic opportunity spaces are categorized in this report into five categories: 1) spaces with low opportunities, 2) spaces with moderate opportunities, 3) spaces with strong agricultural opportunities and lower market opportunities, 4) spaces with strong market opportunities and lower agricultural opportunities, and 5) spaces with diverse and high opportunities.

GENERATIONAL RENEWAL

Generational renewal in agriculture refers to the process of a new generation, especially young people, taking over and continuing the activities of an older generation, often in a family-run agrifood system business or farm. Generational renewal refers not only to replacing the older generation, but also includes empowering a new group with the skills, knowledge and resources to thrive and innovate. In places with declining and aging rural populations, generational renewal is critical for maintaining rural economic and social vitality and ensuring the long-term competitiveness of the agricultural sector.

INTERGENERATIONAL (IN RELATION TO YOUTH)

A relationship that occurs between different generations or involves two or more generations. For youth in agrifood systems, intergenerational is often used in the context of transmission of resources (e.g. land) and knowledge transfer, between youth and adults, both within families (e.g. from parents to their children through inheritance) and beyond families (e.g. between community members).[5]

INTERSECTIONALITY (IN RELATION TO YOUTH)

An approach used to study, understand and respond to the ways in which the status of being a youth intersect with other social factors and/or personal characteristics/identities linked to gender, ethnicity, education, wealth, health status and disability status, and includes how these intersections combine to influence unique experiences of privilege, social exclusion and discrimination.[1]

NEET

Young people who are not in education, employment or training.

URBAN-RURAL CATCHMENT AREA (URCA) FRAMEWORK

The URCA framework defines spatial categories primarily by travel time to urban centres and the population size of those centres. Urban centres are first stratified into categories based on their population (from 20 000 to over 5 million). There are 30 URCA categories in total, where category one represents the largest cities, and the last category corresponds to the most remote areas. Adapting an approach from Cattaneo *et al.*,[6] the first nine categories are grouped as "Urban", the next three as "Peri-urban", the following nine as "Peri-rural" and the final two as "Hinterland". These groupings reflect differences in infrastructure, employment prospects and access to essential services.

YOUTH-ABUNDANT COUNTRIES

Countries characterized by a substantial pool of children and youth which offers a strong potential workforce that can be leveraged for agricultural activities and drive innovation and rural livelihood diversification at least for the next two decades. Most youth-abundant countries are still in the early stages of agrifood systems transition, where agrifood systems, and in particular primary agriculture and related activities, remain the dominant source of livelihood for the growing youth population.

YOUTH AGENCY

The capacity of young people, individually or collectively, to act independently, to take control over the direction of their lives and to influence the direction of changes in society more generally. Young people's agency is bounded by their position in intersecting structures of inequality and exclusion based on age/generation, class, gender, heteronormativity and ethnicity, among others, but also involves their efforts to change these structures.[7]

YOUTH-INCLUSIVE AGRIFOOD SYSTEMS

An agrifood system that actively engages young people as key stakeholders, beneficiaries and decision-makers across all stages – from production to consumption – while addressing the specific needs, aspirations, constraints and potential of youth to ensure equitable participation, decent employment and sustainable livelihoods in agriculture and food systems.[8]

YOUTH MAINSTREAMING

The process of assessing the implications for youth and non-youth of any planned action – including legislation, policies and programmes – in any area and at all levels. It is a strategy for making the concerns and experiences of youth and non-youth an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that they benefit equally and inequality is not perpetuated.[1]

YOUTH-SCARCE COUNTRIES

Countries characterized by an aging rural workforce and lower share of youth in the population, and where a demographic deficit is a key driver of workforce shortages in agriculture. Many of these countries have undergone demographic transitions and rural and structural transformation processes. Their agrifood systems have also transitioned to more modern and industrialized forms and experienced economic diversification, with more non-agrifood system employment opportunities, increasing competition for the shrinking pool of youth labour.

YOUTH-SPECIFIC FACTORS

Youth-specific factors encompass unique characteristics, constraints or opportunities disproportionately affecting young people during this transitional life stage. They include demographic characteristics (e.g. gender, ethnicity and disability status), skill levels, agency and access to productive resources and assets (e.g. land, finance or technology).

YOUTH MOVE FOOD FORWARD

Contact information:
Rural Transformation and Gender Equality Division
Economic and Social Development Stream
www.fao.org/economic/social-policies-rural-institutions/en

Food and Agriculture Organization of the United Nations
Rome, Italy

ISBN 978-92-5-139920-0

9 789251 399200

CD5886EN/1/07.25