Building resilience and enhancing nutrition in Africa's food systems

Global Panel on Agriculture and Food Systems for Nutrition

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SIERRA LEONE • MALAWI • ETHIOPIA

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This report includes important recommendations and advice for leaders at the most senior levels in African countries and international organisations. It is also of direct relevance to decision makers, professionals, actors in the private sector, experts and researchers with interests in food systems and diets.

Many of the individuals will be directly concerned with the production, processing, trade, regulation, supply, and consumption of food. However, others may work in wider areas of policy and business, for example relating to public health and wellbeing, education and equity, economic development and investment, urbanisation, globalisation and demography. Finally, it is also of direct relevance to decision makers concerned with the many and diverse threats and crises facing food systems today – environmental, financial, geopolitical and societal.

This report and executive summary set out practical steps which are essential for strengthening the resilience of African food systems and their transformation, and for enhancing nutrition.

The Global Panel is grateful to Irish Aid for financial support for this project.

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Preface

African food systems now face multiple threats, with potentially very serious consequences in the next 20 years. The Global Panel has worked with three African countries – Ethiopia, Malawi and Sierra Leone – to identify the cascade of challenges they are now facing, and how these could impact food systems, and access to sustainable, healthy diets for all in the future. This report needs to be seen as a warning, not just for policy makers in African countries, but also for international organisations, and the private sector. It asserts that there is a systematic underestimation of the future threats facing food systems; an overestimation of the ability of African food systems to continue to function adequately; and a lack of appreciation of the potential consequences of breakdown.

The findings of this report are grounded in the social, political and financial realities of the three countries. Around 110 experts and Government officials from those nations have been involved in the work, and around 25 experts and stakeholders from other countries and international organisations. Together, they have combined the best science and evidence, with a deep understanding of local conditions and constraints. The outcome is an assessment of how current initiatives in food systems align with developing insights on resilience, and the implications for multiple stakeholders of what needs to be done – both nationally and internationally – to secure better outcomes.

Some may consider that this report is overstating the threat to African food systems, arguing that they have, for the most part, managed to function amidst many past crises – notwithstanding the many millions of Africans for whom inadequate diets are a daily reality. However, food systems are now operating in a world that is becoming considerably more volatile, with multiple threats intensifying and combining in new ways. Climate change, near and distant conflict, human pandemics, crop pests and diseases are obvious examples. At the same time, the capacity of African countries to respond to these challenges is increasingly constrained by a developing debt crisis, combined with high levels of inflation.

At the nexus of these two factors is the inadequate resilience of many African food systems. This is profoundly affecting policy goals around hunger and malnutrition, which in turn, are acting as a brake on delivering a host of policy goals relating to: inequalities, the health of populations and the productivity of workforces, the physical and mental development of children, and economic growth. In the worst cases, social and political instability ensue, and displaced populations and forced migration. In the longer term, successive crises threaten to constantly derail efforts to transform food systems: to deliver the critical goal of universal access to sustainable, healthy diets that are affordable.

While the outlook is very challenging, this report charts a way forward, capitalising on the very considerable human capital across the continent, notably relating to women and youth, and seizing the many opportunities throughout the food value chain, offered by innovation and new technologies. Also encouraging is the high priority accorded to food system resilience in all three Governments involved in this work – and further evidenced here by the Forewords to this report. But national governments cannot redress the situation alone. Civil society, international organisations, development agencies, and crucially, the private sector need to work together. The challenge in this report is for all to engage and play their part.

Sir John Beddington
Chair of the Global Panel
Former UK Government
Chief Scientific Adviser

Dr Agnes Kalibata
President,
Alliance for a Green
Revolution in Africa (AGRA)

Foreword: Ireland

The year 2024 marked the 50th anniversary of the launch of Ireland's Official Development Assistance (ODA) programme. From the start, food insecurity and malnutrition has been a clear focus of international development cooperation, not least because of the deep cultural awareness of Ireland's own history of hunger and famine.

Recent years have seen significant deterioration in global food and nutrition security, due to conflicts, climate extremes and economic downturns. In this context, Ireland has renewed its commitment to food systems transformation as a key strategy towards reducing hunger and malnutrition. Ireland sees food systems transformation as an accelerator towards the achievement of the United Nations Agenda 2030 and the Sustainable Development Goals.

In 2021, Ireland was one of the first countries to submit a national Food System Transformation Pathway, "Food Vision 2030," to the United Nations Food Systems Summit. Food Vision 2030 is focused on: environmental sustainability, viability and resilience, safe and nutritious food, and innovation.

Following the United Nations Food Systems Summit +2 Stocktaking Moment in 2023, Ireland committed to support global coordination efforts around food systems transformation and developed new partnerships aimed at strengthening the research-policy interface in this space. Our support to the Global Panel's *Strengthening resilience in the transformation of food systems in Low- and Middle-Income countries* project came out of this commitment. The particular focus on resilience is closely aligned with Ireland's commitment to support countries to prepare for, respond to, and adapt to shocks, including in the face of the current crises.

The Global Panel has assessed food systems' resilience in three of Ireland's partner countries in Africa – Sierra Leone, Malawi and Ethiopia – and has identified strategies to strengthen them, charting a way forward in the delivery of more resilient, sustainable and affordable food systems and healthy diets for all.

I very much welcome the interdisciplinary nature of this project, the strong multi-stakeholder engagement and the findings of the report which, I believe, will provide a solid basis to inform policy processes at country, regional and global levels. For Africa especially, the report is most timely given the recent launch of the 'Kampala Framework' of the Comprehensive Africa Agriculture Development Programme. Ireland has been proud to support the development of this programme. It will contribute to the Food Security taskforce, a priority under the South African Presidency of the G20, in which Ireland will participate.

I would like to thank the governments of Ethiopia, Sierra Leone and Malawi for their kind support. I also convey my sincere appreciation to GLOPAN for this extremely valuable initiative, which will undoubtedly contribute to strengthening our collective food systems transformation agenda.

Micheál Martin TD
Tánaiste
Minister for Foreign Affairs
Minister for Defence
Ireland

Foreword: Sierra Leone

Leaders across Africa recognise the vital need to transform their country's food systems to deliver sustainable, healthy diets for all. The right to safe and nutritious food is a fundamental human right that is recognised in international conventions and is legally binding for many countries. More than one billion Africans cannot afford a healthy diet, and this is simply unacceptable. By transforming food systems, we can help address many of the continent's – and indeed the world's – most pressing problems, from malnutrition and ill-health, to poverty, inequality, biodiversity loss, and climate change.

In Sierra Leone, under the visionary leadership of President Julius Maada Bio, agriculture and food and nutrition security are the Government's top priorities. This focus is evident from our flagship programme, the Feed Salone initiative, which aims to boost agricultural productivity to fuel inclusive growth; decrease dependence on food imports; and reduce hunger and malnutrition. Our focus on food systems is also evident from our *Medium-Term National Development Plan (2024-2030)*, our *Multi-sector Strategic Plan to Reduce Malnutrition in Sierra Leone (2019–2025)*, and our *National Biodiversity Strategy and Action Plan (2017 – 2026)*. In recognition of our considerable efforts, in 2023 Sierra Leone was proud to become a founding member and co-chair of the *Alliance of Champions for Food Systems Transformation*.

The rapid intensification of the effects of climate change and global shocks have revealed the fragility of our food systems and the pressing need for increased investment in food and nutrition security. In recent years, Sierra Leone has experienced a succession of crises affecting our economy, the price of food imports, and rising energy costs. These crises reduce food and nutrition security and affect food system transformation efforts as they pull attention and resources into crisis management and near-term problems. We must strengthen the resilience of food systems, particularly in an increasingly volatile and uncertain world. A resilient food system not only has the capacity to provide sufficient, appropriate, and accessible food to all, but one that can capacitate transitioning out of fragility for most countries.

The Government of the Republic of Sierra Leone – alongside the Governments of Malawi and Ethiopia – welcomes this timely report. The report draws extensively on local expertise, both within and beyond the public sector, and can directly contribute to the United Nations Committee on World Food Security which is prioritising the creation of resilient food systems. As a government, we are committed to taking the findings forward and we urge all stakeholders including the private sector, the donor community, international development banks, and other non-governmental bodies to join us. While there are challenges ahead, there is tremendous opportunity. Africa is rich in natural resources, has the largest share of the world's uncultivated arable land, the largest youth population, and dominates the list of the world's 20 fastest-growing economies. Let us leverage these opportunities together for better agri-food production, better nutrition, a better environment, and better lives while leaving no one behind.

Dr Mohamed Juldeh Jalloh
Vice President
Republic of Sierra Leone

Foreword: Malawi

The Government of Malawi places Food Systems Transformation Initiatives at the center of its development efforts, through its sustained efforts to optimize productivity and commercialization of the agriculture sector. This is highlighted in the first pillar of its vision: Malawi 2063. Malawi's unwavering commitment to this transformative agenda was made clear at the 2021 United Nations Food Systems Summit, where a number of action tracks to transform its food system were presented. These followed from dialogues with diverse actors in the food systems space. Key goals include ensuring safe and nutritious food and diets, a shift to sustainable consumption patterns, boosting nature-positive food production, promoting equitable livelihoods of people involved in food systems, and building resilience to vulnerabilities, shocks and stress.

Despite a clear vision for the transformation of food systems, the pathway to achieve these goals has been affected by economic dislocations, including high inflation and foreign exchange limitations – together these continue to affect access to farm inputs and implements, and cause low productivity. Adverse climatic conditions i.e., floods and droughts, have further impacted the production base of the agriculture sector, which is viewed as the bedrock of the much-needed industrialization, and for value-added export-oriented growth. Policy slippages necessitated by trade-offs and governance of the food systems transformation agenda, have also impacted resilience throughout Malawi's food systems. Malawi's operationalization of the food systems transformation agenda has been further affected by the challenges of perennial food insecurity, rising malnutrition, and a low export base compared with an increasing demand for imports, particularly in farm and industrial equipment.

Against the background of this litany of challenges, the government has, with support from developing partners, embarked on flagship programs aimed at transforming its food system. In particular, these aim to build the capacity of small-holder farmers to produce more food and increase incomes, through enhanced irrigation interventions, farm input subsidy programs, support for on-farm mechanization, and the use of high-tech initiatives to cope with climatic challenges. The scaling of extension services for smallholder farmers coupled with research and technology development in the agricultural sector represent significant efforts by the Malawi Government to transform Malawi's food system. Medium to large scale farmers have also received government financial and technical assistance to help build their production capacities, especially through the mega-farm initiative, which targets high value crops and livestock as a strategy to augment the national food security drive with exports, and to address foreign exchange challenges.

The government continues to offer policy and programmatic incentives to farmers and industries. These aim to achieve mega productivity of the country's agriculture and industrial sectors, promote local and international markets, and make investments in research and development – as key elements for unlocking the productivity of Malawi's food systems.

Moving ahead, the government of Malawi plans to foster efforts towards building resilience of its Food Systems Transformation, and the resilience of its strategic flagship interventions. It aims to achieve this by: ensuring impactful and effective cross-sectoral governance for the food systems transformation initiative; strengthening the private sector footprint in the country's food systems transformation; and by enhancing efforts addressing food insecurity, malnutrition and poor diets. It will also promote the sustainable and balanced management of water resources in the context of continuing climate change challenges, whilst leveraging the policy and programmatic space to enhance delivery of the national Food Systems Transformation agenda.

The National Planning Commission of Malawi and the Ministry of Agriculture, as the convenors of Malawi's Food Systems Transformation Initiative, continue to collaborate in coordinating the operationalization of Malawi's Food Systems Transformation Initiative. Together, they are fostering stronger partnerships among food system actors, supporting resource mobilization for the country's food systems transformation processes, and building capacities of actors in the food systems space. They are also fostering further cutting edge and transformative research to provide a basis for decision-making, and the development of evidence-based policy and programs for the effective transformation of Malawi's Food Systems.

The Commission as the public body mandated to oversee implementation of development agendas, offers its unwavering commitment to ensure the recommendations of this report are taken up by various actors in the country's food systems transformation space.

I wish to commend the Global Panel on Food Systems for Agriculture and Nutrition (GLOPAN) for an extensive and valuable piece of work whose outputs will augment efforts to build resilience for transformative food systems in Malawi and Africa more generally.

Together, we can achieve sustainably food secure nations across the globe.

Thomas Chataghalala Munthali, PhD
Director General,
National Planning Commission

Foreword: Ethiopia

The Government of Ethiopia put food and nutrition security as priority agenda. It accorded the eliminating all forms of malnutrition through the transformation of food systems and ending stunting by ensuring sustainable healthy diets for the citizens. The Seqota Declaration (SD) is an innovative high level commitment of The Government of Ethiopia (GoE) launched in 2015 to ending stunting in children under two-years by 2030. The Seqota Declaration builds on and accelerated the implementation of the Food and Nutrition Policy and its 10-years operational strategy. The SD has three-phased multi-sectoral implementation 15-years roadmap called Innovation, Expansion and Scale-up phases.

The Seqota Declaration implements high impact multi-sectoral nutrition-specific, nutrition – sensitive and infrastructure interventions. The program aims to achieve high coverage, intensity, and compliance using the existing multisectoral government structures that result in universal access to diets that are healthy, affordable and sustainable. Delivery of these diets is essential to addressing the underlying and roots causes of malnutrition. In the long term it contributes to promoting the health and nourishment of our populations and the development of children, making our societies more equitable, and unlocking jobs and growth in the human capital development and our economies more generally.

Despite the major achievements in improving the food production and nutritional status of our citizens, particularly the mothers and children, the progress is threatened by the fragility of our food systems. These are coming under increasing pressure from different directions. These include the internal factors that affect the food production and consumption as well as those operating pressures from externally, which could affect the resilience of the Seqota Declaration program. These all have posed great challenges to deliver the ever increasing amounts of food and nutrition current and future demands among the program populations.

Against this background, the project reported here is vital to the future viability of the Seqota Declaration and our food systems, and as such, underpins the development of our entire country. The report presents vital issues as ways forward to tackle the challenges, build the resilience of the Seqota Declaration and ensure sustainable consumption of healthy diets. I particularly welcome the exceptionally strong involvement of so many experts, stakeholders and government officials in the work. This has been crucial in ensuring that the advice and recommendations contained here, are firmly embedded in the realities and constraints faced by our circumstances.

I hereby confirm the commitment of our government to immediately consider the findings contained in this report, with a view to using them to develop and implement strategies for moving forward. In this respect, I would welcome the contributions of diverse stakeholders particularly the Global Panel and expertise mobilized, both in the country and internationally, to work together to catalyze decisive actions at scale.

Hiwot Darsene
Lead Executive Officer,
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The Global Panel is also grateful to the many individuals and organisations from across Ethiopia, Malawi and Sierra Leone who were involved in the detailed technical work – some of these are specifically mentioned below. The Global Panel would also like to thank the Representatives of the Global Panel members, the staff from **Irish Aid**, and the many other individuals who contributed views and advice, attended workshops in Africa, peer reviewed drafts of the report, and provided other support.

Consultation workshops in Ethiopia, Malawi and Sierra Leone

A series of consultation workshops were held in all three countries to inform the project. These were attended by national experts, local stakeholders and international agencies involved in the development of food systems.

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ACE Agricultural Commodity Exchange for Africa
ACF Alliance of Champions for Food System Transformation
AfCTA Africa Continental Free Trade Agreement
ADSS Animal Disease Surveillance Systems
AfDB African Development Bank
AHCX Auction Holdings Limited Commodities Exchange
ASF Animal Source Foods
BMZ German Federal Ministry for Economic Cooperation and Development
CAADP Comprehensive Africa Agriculture Programme
CAP Common Agricultural Policy
CBAM Carbon Border Adjustment Mechanism
CFSVA Comprehensive Food Security and Vulnerability Analysis
DCAFS Donor Committee on Agriculture and Food Security
DDS Dietary Diversity Score
DRM Disaster Risk Management
DSA Debt Sustainability Analysis
EPHI Ethiopian Public Health Institute
EU European Union
FAO Food and Agriculture Organization of the United Nations
FBOs Farmer Based Organizations
GDP Gross Domestic Product
GHG Greenhouse Gas
GIS Geographic Information System
HDI Human Development Index
IFAD International Fund for Agricultural Development
IFPRI International Food Policy Research Institute
IMF International Monetary Fund
IPCC Intergovernmental Panel on Climate Change
LMICs Low- and Middle-Income Countries
MDD Minimum Dietary Diversity
M&E Monitoring and Evaluation
NCQG New Collective Quantified Goal on Climate Finance
NDCs Nationally Determined Contributions
NGOs Non-Governmental Organisations
OECD Organization for Economic Cooperation and Development
OFID OPEC Fund for International Development
PI-CREF Presidential Initiative on Climate Change, Renewable Energy and Food Security
PLW Pregnant and lactating women

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Executive summary

1. Introduction: The resilience of food systems and their transformation

It is now widely recognised that food systems in Africa, and other parts of the developing world need to urgently transform – with the goal of delivering universal access to sustainable, healthy diets for all. That was a key message in the Global Panel's 2020 Foresight report: Future Food Systems: For people, our planet and prosperity.[1] Since then, leaders in countries across the world have committed to change, most notably at the 2021 UN Food Systems Summit, and more recently at COP28 in Dubai. The growing political momentum reflects the realisation that these diets remain inaccessible to over 3 billion people globally, and more than 1 billion in Africa, with the ensuing hunger and malnutrition acting as a brake on many policy agendas.[2] These relate, for example, to supporting the physical and mental development of children, promoting the health of populations, addressing entrenched inequalities, and engendering economic growth in developing countries.

Despite the manifest political will, it is widely accepted that progress in transforming food systems remains too slow. In response, the Global Panel, with funding from Irish Aid, has undertaken a one-year programme of work in Africa. The aim was to work in partnership with local experts and stakeholders from three very different countries, and to take an in-depth look at one critical aspect of the transformation – the resilience of their food systems, and the measures needed to strengthen this. The partner countries were Sierra Leone, Malawi, and Ethiopia.

By focusing on social, political, and economic realities on the ground, the project reported here is very different from work previously undertaken by the Global Panel. The aims were twofold: to explore the gap between the resilience of national food systems and the threats they face today and over the next 10-20 years; and, for the experts in those countries, working with international experts, to develop plans for strengthening resilience – both of their food systems, and of the transformation process that they are undergoing.

The primary focus here is to inform government decisions in the three countries, and across Africa. But there are also important messages for other stakeholders in Africa and internationally: donors and development organisations, international organisations concerned with trade and finance, the private sector and civil society.

Key messages

To achieve sustained transformation, much greater priority needs to be given to strengthening the resilience of food systems across the continent as they are challenged to cope in a more uncertain and volatile world. The view of experts involved in the work reported here, is that in the future, some food systems in fragile settings may be at risk of collapse as they continue to be impacted by a 'cascade of crises'. This would pose very serious consequences for the populations concerned – in terms of hunger and malnutrition, social stability, and migration.

Despite these challenges to its food systems, Africa has very significant strengths to draw on to realise its substantial potential. The first lies in its growing youthful populations who can innovate and drive change. New opportunities to strengthen resilience and create jobs are offered by the development and roll-out of innovative technologies such as digital and genomic tools to help provide producers with the means of transforming their food systems – to make them more resilient, so that they deliver sustainable, healthy diets for all. Such measures could contribute substantially to implementing the forthcoming Kampala Declaration (see Box 1).

There is also considerable potential to increase the opportunities for women within African food systems. Too often they are disadvantaged over their male counterparts.

This report has identified major opportunities for strengthening food-system resilience while also potentially benefiting the health of populations and the environment. Agro-ecological management practices are one example. Opportunities in other parts of food systems include: strengthening multi-level governance and rethinking trade policy to better support their resilience; and promoting private sector investment in food systems transformation. These examples show that not all interventions require substantial government financial resources to take forward.

All relevant stakeholders are exhorted to work together to strengthen the resilience of Africa's food systems. Action needs to be rolled out at scale to be truly impactful, but severe resource constraints, and debt crises threaten to limit action at scale across the continent. All relevant parties need to come together to meet this challenge, including the public and private sectors, civil society, donors and other international organisations.

Box 1: The broad political context within which policy change in Africa's agrifood system will be implemented, is about to change

The 4th CAADP Biennial Review (2024) concluded that the continent remains off-track to meet the Malabo Declaration goals by 2025. With the Malabo Action Plan reaching its end in 2025, agreement has now been reached on the Kampala Declaration which will be adopted in January 2025. It reflects an important new policy direction for the continent.

Nations are being urged to create resilient, inclusive, and sustainable agri-food systems through embracing a collective shift toward transformative solutions that address food security, climate resilience, adaption to unforeseen challenges including pandemics and extreme weather, and economic growth. This should be viewed as part of wider action to strengthen the resilience of food systems more generally.

It is hoped that the conclusions of this report, drawing on the realities of three African countries, will offer important and timely insights for low- and middle-income countries in Africa and beyond.

2. Challenges to African food systems

African food systems are coming under increasing pressure from three directions:

- **They are being challenged by a 'cascade of crises'.** These include conflict, (near and distant), human pandemics, pests and diseases of crops and livestock, the risk of financial instability due to national debt crises, and environmental stresses. Some threats are set to intensify in the decades ahead: this report asserts that whatever the expectation of future delivery of Nationally Determined Contributions, it would be prudent for African food systems to be strengthened to be resilient not just to 1.5°C warming, but to at least two degrees (above pre-industrial levels).[i] The assertion that the 21st century may be entering an 'age of disruption' is of particular relevance to African countries where small-scale farming dominates.

- **Africa's food systems must evolve to meet the demands of its growing populations.** These are projected to rise from just over 1.5 billion in 2024 to over 1.8 billion in 2035, and 2.5 billion by 2050.[3,4] These increases will add considerably to the pressures on Africa's food systems – not just from the greater numbers, but also from shifting diets as populations become wealthier. Increases in per-capita consumption of meat and other foods with relatively high environmental footprints are likely. At the same time, African food systems will also need to cope with a major expansion of its urban populations. These are projected to reach 1.2 billion by 2050 – an additional 600 million people.[5]

- **African countries are heavily constrained by mounting debt crises and many competing priorities.** These, and the other pressures mentioned above, point to the need for assistance from other stakeholders – within countries and internationally – working closely with African governments.

Governments may add to the risks facing their food systems by underestimating the scale and complexity of future threats. If not carefully managed, these could combine, with each amplifying the impacts of others. Bold action is required to strengthen resilience, which will inevitably come with political and economic costs. However, the risks and long-term costs of inaction, including widespread food insecurity, economic instability, and diminished public trust are far greater. Proactive investment is a critical safeguard for the future.

3. Strengthening food-system resilience in Sierra Leone, Malawi and Ethiopia

All three countries have high ambition to transform their food systems to deliver universal access to sustainable and affordable healthy diets. However, their efforts to deliver on that goal are threatened by multiple interacting crises. At the same time pressures on their food systems, including land and resource use, are set to increase substantially from population growth, as mentioned above.

The approach adopted by each of the three countries for this analysis was distinct, reflecting their different perspectives, and very different local circumstances. Further detail is set out in Box 2. [ii]

- **Each of the countries has placed possible measures to strengthen food-system resilience into the context of their existing flagship programmes.** This has the immediate advantage that those programmes generally enjoy support at the highest level of government, and already involve different government departments, thereby providing a ready-made platform for collaboration to strengthen food-system resilience. Also, the wider perspectives in this project around diets and nutrition, have helped to inform how the ambitions of those programmes can be broadened to encompass the demand side and to give greater emphasis to the provision of sustainable, healthy diets.

- **Experts in each of the three countries took a view of which future threats and risks were the most important (see below).** However, the wider work of this project has exposed a much broader range of risks that need to be considered.

- **The need to roll out actions at scale amid severe resource constraints was a recurring theme.** This was seen as a considerable challenge with no easy solutions. A number of proposals relating to other stakeholders were identified (see below).

- **National/sub-national partnerships were seen as important.** However, it was accepted that there were potential difficulties around these that needed to be carefully considered.

i See Chapter 3 of the full report for a discussion of this point.

ii A detailed account of the findings for each of the countries may be found in Chapters 4 – 6 of the full report.

Box 2.1: Key findings from Sierra Leone

The situation today: The country is one of the poorest in the world, ranked 181 out of 191 countries in the Human Development Index (HDI) and with a GDP per capita of US$635 in 2023.[6,7] National surveys have shown how the country's food and nutrition security is deteriorating: food insecurity increased by about 12% over ten years, from 45% in 2010, to 57% in 2020.[8] In 2024, 82% of the population were food insecure among which 18% of households were severely food insecure.[9] The demands on the food system will intensify as the population grows – from around 7.65 million today, to over 12.5 million by 2050.[10]

The Feed Salone Program, championed by President Bio, recognises the critical importance of the agricultural sector in the country's economy.[11] It aims to reduce dependence on rice imports, encourage investment in other crops and reduce malnutrition and hunger. But further action is needed to deliver universal access to affordable and sustainable, healthy diets that are essential to the country's future, and to strengthen resilience in the face of worsening threats.

Threats: Five categories of threats were identified which could undermine resilience-building and transformation processes in Sierra Leone's food system. These are socioeconomic factors (particularly associated with high levels of poverty), food system activities (e.g. high costs of agricultural inputs and labour), the policy environment (these are particularly diverse – examples relate to access to insurance and concessional loans, trade barriers and high taxation), production capacity (e.g. relating to low private sector investment) and diverse environmental factors (e.g. climate change, deforestation, land degradation and pests and diseases).

Plans: Sierra Leone's vision in building and transforming sustainable food systems requires concerted efforts by all actors including government, the private sector, and development partners. Seven strategic measures are set out in this report, ranging from strengthening multi-level governance of food systems, to closing the nutrition security/nutrition resilience gap, and promoting ethical private sector investment in food systems transformation. Specific actions are also provided for the short – (1-4 years), medium – (5-9 years) and long term (10+ years). However, substantial resources need to be mobilised to enable plans to be rolled out at scale. Feed Salone alone will cost US$1.6 billion to implement fully by 2028.

Box 2.2: Key findings from Malawi

The situation today: In the current lean period (October-March) an estimated 5.7 million people are acutely food insecure, up from 1.5 million in the same period in 2021/22.[12] Malawi's population is projected to grow from 20.3 million in 2024 to an estimated 33.6 million in 2050.[13]

The transformation agenda of Malawi's food system is closely linked to Malawi's vision towards 2063, aiming at attaining an inclusively wealthy and self-reliant nation. This vision is operationalised in 10-year phases, the first of which pursues two key milestones: graduate the country to lower middle-income rank, and meet most of the Sustainable Development Goals (SDGs), including ending hunger, ensuring food security and improving nutrition by 2030.

These goals align with Malawi's Food System Transformation Initiatives (FSTI), which is seen as a catalyst to achieving Malawi's vision. Food-systems transformation is considered vitally important to delivering on these ambitions: ensuring resilience of both its food systems and the transformation process itself are priorities.

As of now, food and nutrition security is a major concern. The 2023/24 national crop production estimates were recorded at their lowest, with widespread food and nutrition insecurity affecting close to four million of the population.[14] 80% of farmers are smallholders, depending on the rains in a single growing season. Moreover, inadequate sustainable agricultural practices are creating challenges, given the cost and scale of land and soil degradation, and environmental problems being built up for the future. Persistent hunger threatens macro-economic and social stability, and security.

Threats: Important factors affecting food-system resilience were identified as: climate change and high costs of farm inputs and implements, which particularly affect smallholder farmers; and institutional and governance factors relating to ineffective policy implementation. A particular concern is macroeconomic instability characterised by low economic growth, high inflation, and devaluation of the Kwacha, which have had direct negative impact on food systems transformation initiatives. At the household level, repeated dips in food production due in part to fluctuating hydrological conditions continue to paralyse the capacity of households to obtain better livelihoods.

Plans: The proposals set out in this report include prioritising the implementation of five action tracks within the Food Systems Transformation Initiative. These focus on; a) safe and nutritious food, b) shifting to healthy and sustainable consumption patterns, c) boosting nature positive food production, d) advancing equitable livelihoods and e) building resilience to vulnerabilities, shocks and stress. Further, action aims to strengthen governance to engender better progress in food-system transformation. These actions are to be operationalised at short-term (1-4 years); medium-term (5-9 years) and long-term (10+ years) timescales.

Box 2.3: Key findings from Ethiopia

The situation today: Ethiopia is subject to a particularly diverse set of threats and challenges. They include extreme poverty, limited resource availability, rising living costs, internal conflicts, and climate-related factors. All affect society both at community and individual levels. The population is projected to rise from around 130 million today, to nearly double by 2050, adding considerable pressures on the food system.[15,16]

The focus of the work reported here concerns strategies to strengthen the resilience of Ethiopia's food system, specifically by building resilience into the implementation of the country's Seqota Declaration.[17] This Government-led Declaration focuses on food and nutrition security, multisectoral collaboration, food systems resilience, and environmental sustainability while aligning with national policies and strategies. A key goal is to eliminate child stunting by 2030.

Threats: The resilience of the country's food production is particularly affected by climate change, environmental sensitivity, biodiversity loss, soil degradation, and water management issues, as well as economic vulnerability. Additionally, gender inequality, financial exclusion, social and cultural barriers, and absence of mainstream disaster risk management present further risks to the resilience of the Seqota Declaration.

Plans: Thirteen broad opportunities were identified to transform the Declaration into a cohesive strategy for enhancing resilience in Ethiopia's agro-ecological production systems in the face of complex challenges. These range from climate – and nutrition-smart approaches, to strategies designed to align humanitarian support with development and peace-building efforts; and strengthening and expanding implementation of nutrition interventions at the grassroots level. As in the other two countries, integrated efforts were seen to be key: the approach proposed here emphasises collaboration and community engagement, as well as innovative solutions.

4. Key messages for African governments

It is essential that efforts to strengthen resilience of food systems are integrated into plans for their transformation. While there is considerable investment and ambition targeted at agricultural production and agro-processing across the continent, much of this remains largely disconnected from the sustainable, healthy diets agenda. This is a substantial missed opportunity. The outcome is that where nutritious foods which contribute to a healthy diet are available, they are at prices which are unaffordable for over one billion people in Africa. There is now a growing commitment by African leaders to transform their food systems to address these concerns. However, efforts to implement transformation pathways risk being constantly derailed – as governments divert both economic and political resources to cope with short-term disruptions to food and nutrition supply, and price spikes.

Measures to strengthen resilience need to take a broad view: resisting threats as they develop, recovering after disturbances, and proactively reorienting to prevent problems from emerging.

They should also consider five important dimensions of resilience. These broadly align with different classes of stakeholder who may need to act:

- **Production resilience based on agro-ecological conditions.** Agro-ecosystems with rich biodiversity, healthy soils, abundant water, and landscape heterogeneity typically fare better during shocks such as droughts and/or pest outbreaks; and they typically recover faster.
- **Value chain resilience based on economic characteristics and infrastructure.** This dimension relates to the value chain that links producers and consumers – it has both economic and infrastructural elements.
- **Consumer and household resilience based on livelihoods and assets.** Evidence drawn from livelihoods data show families who have substantial human and financial capital are more robust and better able to recover and reorient their livelihoods to cope with many kinds of shocks.
- **Community resilience based on social capital and civil engagement.** A substantial amount of food-system resilience is mobilised at a community level, for example, involving neighbours and community groups rallying during times of need to help each other. Communities with well-developed social and built infrastructure, functioning civil society organisations, lower crime rates, and access to services have better capacity to mobilise collective responses to challenges.
- **Institutional resilience based on governance and safety nets.** Formal institutions include governments, but also the development and donor communities. When problems extend beyond the scope of a household or community, or even a nation state, these institutions can mobilise proactive and reactive responses. Another key element of institutional resilience is the ability to anticipate threats and challenges on the horizon, and to plan for them.

This suggested approach will provide a practical framework on which to 'hang' actions, and a means to identify where proposed actions are uneven in their coverage (see Chapter 2 for a more detailed explanation). It can also be used to consider how actions may interact and have secondary impacts on others, to evaluate trade-offs and to consider unintended consequences.

Box 3 provides a checklist for African governments planning to strengthen the resilience of their food systems.

Box 3: Guidance for policy makers strengthening the resilience of their food systems

1. A comprehensive understanding of the threats that a food system could face in the future is an essential starting point. This should include: planning for unexpected events, going beyond past experiences (notably due to changing climate), considering how some threats might have impacts which may seem beyond credible (e.g. COVID-19), and also how threats may interact.

2. The cost effectiveness of different policies and actions need to be explored – as well as the risks and costs of inaction. The aim is to find policies and actions that work under most future outcomes (scenarios). Evaluating benefits that go beyond food systems is also likely to be important – e.g. relating to health and healthcare costs, worker productivity, and addressing societal inequalities.

3. Looking right across food systems – from producer to consumer – is essential. All parts of the system need to work together, and be integrated with sectoral strategies (notably across water-energy-food)

4. All relevant parts of government need to be persuaded and incentivised to play their part. Direction and strategic oversight at the highest levels of government is essential to bring different interests together. Strengthening the resilience of food systems needs to be recognised as a government-wide priority and embedded within wider governmental priorities. Relevant departments need to appreciate how their own policy areas would benefit; and they need to be involved in developing and agreeing a cross-governmental strategy with clear actions and deliverables for each.

5. Linking a cross-government strategy (to strengthen resilience) to wider government flagship programmes can help to leverage political and other resources. However, it is important that those flagship programmes do not over-constrain any resilience strategy.

6. Strengthening access to nutritious foods is important and needs to be explicitly addressed – food security with a focus on staples is important but not sufficient. The ultimate goal should be universal access to sustainable, healthy diets, with diversification of food systems to include nutritious under-utilised crops.

7. It is important to assure access to sustainable and affordable energy to power food systems transformation. Inadequate access to energy and power affects all segments along the food systems value chain, and is a major contributor to food-system inefficiencies.

8. Individual policy choices need to be informed by the best available science and evidence. And they need to be thought through to assess unintended consequences, and trade-offs.

9. Developing pathways to build resilience into food systems needs to include processes to monitor progress and ensure accountability. This is crucial to the development of more resilient food systems and engendering trust and confidence in decision makers.

10. Consideration should be given to fostering multi-stakeholder collaboration. This is essential and can help remove obstacles to building resilience.

5. Key messages for other stakeholders – in Africa and internationally

It is not feasible for African governments, such as in Ethiopia, Malawi and Sierra Leone, to fully address the diversity and scale of future threats to their food systems alone. This is in large part because of severe resource constraints amidst growing national debt crises. Assistance is needed from other stakeholders as set out below.

5.1 The donor community

There is a strong case for the donor community to consider how it can better support African countries to build resilience into their food systems and their transformation pathways, and so help to secure universal access to sustainable, healthy diets. The following are the views expressed by African experts involved in the work reported here.

- **Donors should consider allocating a major increase in resources to strengthen food-system resilience, and to roll out programmes at scale.** Increased funding is needed to meet the severity of future threats to food systems, and the danger of their future collapse. Also, in Malawi and Sierra Leone, for example, many experts involved in the work of this project considered that there are too many small projects which fail to have sufficient aggregate impact to create the rapid and widespread change that is needed across multiple sectors.
- **Better coordination and cooperation between donors is desirable.** This would engender the roll-out at scale advocated above and help to avoid overlapping programmes.

- **Donor support to transform food systems and make them more resilient needs to place more emphasis on the longer-term.** This is not to discourage shorter-term projects. However, transforming food systems is a long-term challenge, and needs to take an equally long-term view of threats and risks to food systems.

- **The balance between donor support for vulnerable populations at times of crisis (e.g. through social safety nets), versus support to make food systems more resilient, needs to be carefully considered.** Both have their place. However, achieving greater resilience would engender self-reliance, and better access to sustainable, healthy diets for all in the longer term.

5.2 The private sector

Private businesses need to be at the heart of any strategy to strengthen food-system resilience. Governments and businesses need to work together without delay to develop joint strategies to strengthen the resilience of food systems. This needs to be a priority and will add considerable value to the benefit of both. Strategies should consider the following:

- **Ensuring that a stable policy and regulatory environment is in place which supports micro-, small- and medium-enterprises (MSMEs) along food value chains, as well as physical security and security in land tenure:** all are important factors influencing investment decisions at both large and small scales.

- **Priorities should be agreed for research and capacity building which promote the development and roll out of new and novel technologies, for example in digital applications.** These should include increasing the capacity of smallholders and MSMEs to access and utilise new innovations.

- **Regulation should be considered as a possible stimulus for change – for example by creating a level playing field for smaller businesses to operate.** Individual firms, and particularly MSMEs, may be reluctant to be 'first movers', where that might involve additional costs and investments which their competitors would not incur.

- **Government policies and incentives should be considered to 'nudge' or encourage companies to strengthen resilience in ways that have societal, as well as commercial benefits.** The complexity of food systems means that businesses may have many options to act to strengthen resilience – involving different winners and losers, and different implications for society (as opposed to profits).

- **The informal food sector needs to be encouraged and better supported.** It has critical roles to play in supporting food security, and in improving access to dietary diversity, particularly in times of crisis. Informal food markets (typically open air) help poorer consumers access fruits, vegetables, dairy and meat products. They also offer important opportunities for livelihoods and income generation, particularly for women on low incomes, and young people – these in turn, contribute to their resilience.

5.3 The international community

Climate-related finance and policy:

Agreement was reached at COP29 for the New Collective Quantified Goal on Climate Finance (NCQG). This aims to increase annual international support for developing countries from US$100 billion to US$300 billion (by 2035). It also exhorts all actors to work together to scale up climate finance to developing countries, from public and private sources, to US$ 1.3 trillion per year by 2035. This is to be welcomed, but there remain substantial areas of concern.

First, it is essential that food systems, their transformation, and their adaptation to climate change, are given high priority in the allocation of funds. This is consistent with the widespread recognition of the critical importance of food systems to multiple policy agendas beyond food and nutrition. Second, identifying and planning new adaptation measures, and rolling out existing measures at scale needs to proceed urgently as the effects of climate change continue to intensify. This argues the need for any increased funding to be made available quickly and efficiently. Adaptation measures are particularly important for LMICs which are disproportionately affected by climate change, and least able to resource adaptation.

The new focus on food systems at UNFCCC, UNCBD and UNCCD COPs is to be welcomed, as are the many commitments to transform food systems made by nations at these different international fora – as well as at the 2021 UN Food Systems Summit. However, there remains a substantial gap between the rhetoric at such events, and the reality in many countries, where the pace of change is slow. This is concerning since such a transformation is essential: to enable vulnerable populations to be resilient to climate change; for food systems to become more sustainable; and to deliver access to healthy diets that are essential for physical health, wellbeing and future prosperity.

Trade

International trade policy needs to better support the resilience of food systems – not just in Africa, but globally. Trade has a critical role to play in keeping vulnerable populations fed at times of crisis. Yet at times of geopolitical uncertainty, an over reliance on imports creates vulnerabilities, partly because trade mechanisms are not designed for these goals.

Strategies, such as the African Union's Malabo Declaration on Accelerated Agricultural Growth, together with its successor the Kampala Declaration, and the Africa Continental Free Trade Agreement (AfCTA) should be better facilitated. The trade balance of the three countries

considered in this report (and others in Africa) are negative, thereby acting to increase their indebtedness. Trade in manufactured goods, especially food products, between and among African countries should be better supported – for too long African countries have principally traded in raw materials. New national agro-industrial policies are needed that are synchronised with regional and global trade policies. Overall, the pursuit of agro-industrialisation which emphasises agro-ecological approaches, and crop diversity to promote sustainable, healthy diets, has the potential to address multiple challenges to building climate resilience in food systems transformations, from production to consumption.

Relations with other countries and power blocs – the European Union

Dialogue between African Countries and the European Union (EU) should be developed further, to discuss how EU policies link with the resilience of food systems in Africa. Food systems in Africa and Europe are closely intertwined, notably through trade, and EU support for food agencies and scientific collaboration. Also, EU policies such as the Common Agricultural Policy, have long impacted African food systems. The 'Green Deal' and other 'greening' policies are also having a substantial impact, for example on deforestation regulation, the Corporate Sustainability Due Diligence Directive, the Carbon Border Adjustment Mechanism (CBAM) and the imposition of stringent standards.

Europe has a strong interest in ensuring that African food systems are resilient. This is not only in view of its present trade with Africa, but also due to its humanitarian policies, as well as wider implications for politically sensitive areas of policy, for example on economic and political stability. The dialogue between African countries and the EU on food systems should consider the following objectives:

- **Develop a better understanding of the possible negative and positive effects of EU policy development on vulnerable countries.** The aim would be to integrate those considerations into the design of new policies.
- **Use the interchange about those policies as a vehicle to include more voices from vulnerable countries and populations.** A particular goal should be to access knowledge and understanding of local circumstances to evaluate the possible impacts of policies on vulnerable populations.
- **Ensure that the EU's pollution and environmental footprint is not externalised at Africa's expense.**
- **Foster further support for research and innovation specific to food systems in African countries.**

In addition, The African Union Commission could usefully support African member states to estimate national carbon stocks with a view to negotiating fair carbon trade with European countries. African countries could use their carbon stocks as collateral for loans related to 'green food systems projects'.

5.4 The research community

Suggested research priorities are as follows:

- Researchers should adopt a gender, youth and social inclusion framing for research and engage with groups concerned with promoting equity.
- Encouraging researchers to engage in participatory and community-based research to co-develop locally relevant resilience programming.
- Developing a better understanding of how regenerative, climate smart agricultural practices can be incentivised among smallholder farmers.
- Developing a better understanding of how novel technologies can be applied in ways that enhance resilience at the agro-ecological level.
- Food systems governance issues – for example, in relation to multi-stakeholder networks and communication channels to build inclusion and agency for local voices (farmer groups, extension staff, and market trader associations).
- The use of trade agreements and regulation (global and regional) as a means to strengthen the resilience of food systems, and to ensure secure access to sustainable, healthy diets, and the foods that are essential for those.
- The development of digital technologies and other novel approaches: consideration needs to be given to issues concerning intellectual property to ensure all relevant actors in the food system are able to access such developments.

PART I

The resilience of African food systems

1 Introduction

Introducing the project

Today, food systems are failing to provide even barely adequate diets to countless millions.[1] In 2023, 28.9% of the world's population (2.33 billion people) were moderately food insecure or worse – up from 25.4% from before the pandemic.[2,3] In 2022-23, an estimated 11.6% of the global population endured severe food insecurity.[4] By 2030, FAO has projected that the number of chronically undernourished people worldwide could reach 582 million, with more than half of these being in Africa.[2] Ensuring everyone in the world has access to adequate food and nutrition should be a global priority, yet the international policy community is failing to meet this challenge.

As stark as this picture is, the situation is set to deteriorate markedly over the next decade. Food systems in Africa will need to function in a world becoming more uncertain, and volatile, and where threats such as climate change are set to intensify. COVID-19 has shown how devastating disruption can suddenly and unexpectedly materialise. A key message of this report is that Africa's food systems will increasingly struggle to meet the dietary needs of their burgeoning populations and some may even risk collapse.

Against this sombre background, the Global Panel has partnered with governments and experts in Malawi, Sierra Leone, and Ethiopia, as well as international experts, to undertake a one-year study to look in depth at the resilience of food systems. Funded by Irish Aid, the goal has been to encourage and inform the development of realistic and pragmatic strategies to substantially strengthen each country's capacity to deliver affordable and sustainable, healthy diets for all – in ways that are resilient to the future. The work builds on the Global Panel's Foresight 2.0 report, as well as flagship programmes in the three countries.[5] Crucially, it embeds these strategies in the social, political and economic realities of each country. As such, the work, as reported here, contains important insights and advice for low- and middle-income countries across Africa and elsewhere.

Strengthening the resilience of food systems in Africa really matters. Unless addressed, food insecurity and malnutrition will continue to act as a substantial brake on delivering multiple Sustainable Development Goals (SDGs) beyond hunger and malnutrition. Ensuring secure and universal access to diets that are sustainable, healthy, and affordable, needs to be recognised as a prerequisite for eliminating entrenched inequalities and poverty; promoting healthy populations and economic growth; and protecting vulnerable populations from the effects of climate change.

This report shows that a great deal can be achieved, drawing on the considerable political will and intellectual resources of the three countries, as well as the capacity and drive of their local communities and citizens. Africa's youthful workforce, in particular, offers multiple opportunities to innovate and drive change. However, given the scale of the challenges and the substantial resource constraints the three countries are already facing, it is clear that there is a need for major policy shifts together with substantial new action by other stakeholders in Africa and globally.

1.1 What we set out to do and who needs to read this report

The goal of this project was to work with the national governments of Sierra Leone, Malawi and Ethiopia to encourage the development of practical strategies to boost the resilience of their food systems (see Chapters 4-6). In so doing, it builds on the Global Panel's 'Foresight 2.0' report *Future Food Systems: For people, our planet, and prosperity*. These contrasting countries, from three different parts of Africa, present a cross spectrum of challenges faced by many low- and middle-income countries (LMICs). These countries also stand out in that their governments have shown leadership on food systems: for example in launching flagship agri-food related programmes designed to reduce food insecurity and improve access to high quality diets, and in championing an ambitious agenda for food system transformation. The funding from Irish Aid has allowed the Global Panel to partner, both with leading experts and senior government officials from each of the three countries.

The work has engaged primarily with national policy makers as the key audience for its recommendations. These are policy makers working within the domains of government who have responsibility for food systems, and nutrition in the three focus countries – Malawi, Sierra Leone and Ethiopia. They are the individuals who are making policy decisions about which programmes and policies to create and implement, what to fund and, crucially, what not to fund. Food systems also encompass a great many actors outside of government. Hence, within the constraints of a one-year project, the project built coalitions and engagement that cut across sectors to include the private sector, non-governmental organisations and donors.

While this report considers three African countries in depth, many of its messages and recommendations will be of interest to policy makers in other African countries, and LMICs more generally. (Chapter 7 sets out key messages which have broad applicability for other countries.) The report's messages will also be highly relevant to policy makers right across government. Ensuring the provision of sustainable, healthy diets requires the coordination of multiple sectors, actors and agencies. This is needed to realise profound effects on population health, to relieve pressure on health services, and to raise workforce productivity. These diets are also critical for children's early years, enabling them to realise their full physical, mental and earning potential. Areas of government policy beyond agriculture, food production, and health, which have important roles to play in strengthening food-system resilience and dietary outcomes include: finance and trade, transport infrastructure, management of environmental resources, the provision of social safety nets, and research and development.

While focusing primarily on government stakeholders, this report also highlights the need for fundamental shifts in policy and substantial action beyond government departments and the borders of individual countries. It contains important recommendations for stakeholders in international bodies, particularly concerned with finance, trade, and development; as well as actors within the donor community, researchers, and the private sector. The support of each of these groups is crucial in creating more resilient, equitable, secure and sustainable food and nutrition for all. Chapter 8 of this report draws together key messages for these other stakeholders.

Box 1.1: The resilience of food systems: women and youth

Both are closely affected by the resilience of food systems, but in very different ways. Women are key workers throughout food systems, yet too often, they are disadvantaged in accessing nutritious food compared with their male counterparts. Africa's burgeoning youthful populations are critically dependent on well-functioning food systems as major sources of employment, and for the creation of new job opportunities.

Implications for women and Africa's youth are themes which run throughout this report in view of their roles and relationships within food systems, and their potential as agents for change.

Feed Salone, Ministry of Agriculture and Food Security

1.2 Poor diets in Africa – the accelerating crisis in food and nutrition security

The stark reality is that food systems in Africa – and across the world – have not only failed many millions of people in recent decades but are increasingly failing to keep pace and adapt to a world that is rapidly changing. While food systems continue to deliver much, they remain beset with systemic problems that will not withstand the scale and intensity of future threats and challenges. In terms of malnourishment, the World Health Organization estimated that globally, in 2023, 2.5 billion adults were overweight, including 890 million who were living with obesity, while 390 million were underweight.[5] At the same time, 149 million children under 5 were estimated to be stunted, 45 million wasted, and 37 million were overweight or living with obesity.[5] Populations in sub-Saharan Africa and South Asia continue to be disproportionately affected.

The levels of malnutrition illustrated above, demonstrate a profound failure of policy. They play a central role in perpetuating entrenched poverty and inequity, and they disproportionately affect women (see Box 1.1).[6] More generally, healthy diets were unaffordable for 2.8 billion people across the world in 2022.[3] And even if affordability was not an issue, today's food systems only grow one third of the fruits and vegetables that would be required to provide healthy diets for everyone (and this does not account for the high levels of waste in these foods).[5,7] Food systems are also in a vicious cycle with the Earth's environmental systems. Around one third of anthropomorphic greenhouse gas (GHG) emissions are linked to food;[8] and they are a major driver of environmental degradation, notably deforestation and biodiversity loss.[9] The consequential impacts on agricultural productivity drive further intensification of food production (Chapter 3 outlines the risks faced by African food systems and some of the current ways that governments are responding to these threats).

Box 1.2: Key concepts and a note on terminology

The broad field of food systems and resilience has a large and complex terminology. The following shows how key concepts have been used in this report.

Food systems

The actors and relationships, from farm to consumer, that lead to food being produced and consumed. The focus of this report is on five key dimensions of resilience within the food system: the agro-ecosystem that produces the food; the supply chains that link producers and consumers; the household level that focuses on poverty and issues related to economic marginalisation; the community level that focuses on social capital; and formal institutions and governance mechanisms that provide social protection. These five dimensions may be characterised as 'lines of defence' as they are likely places to intervene to strengthen resilience.

Shocks and disruptions

These are generally shorter-term problems that emerge relatively suddenly and threaten to disrupt the ways food systems function. Examples of shocks or disruptions might be a change in currency value that affects the price of imports or exports, political problems such as conflict that change the way that supply chains work, or environmental problems such as droughts and floods that may be exacerbated by climate change.

For this report, a distinction is drawn between the relatively short-term shocks and disruptions, and the chronic stresses linked with poverty and chronic malnutrition. Given the accelerating impact of geopolitical shocks and climate change, this report focuses on how to manage food systems accordingly, while not inhibiting longer-term efforts to transform food systems and address chronic stresses.

Healthy* diets

These are essential to address the so-called 'triple burden' of malnutrition: hunger and micro-nutrient deficiencies as well as overweight and obesity, which are linked to several diseases, notably diabetes and cardiovascular disease.[11] In this report, 'healthy diets' is based on the detailed characterisation used by the World Health Organization.

As emphasised in the previous Global Panel Foresight 2.0 report[5], it is important for such diets to be available, affordable and accessible to all, and to be sustainably produced.

Food security and nutrition security

Food security is taken to encompass the four pillars of access, utilisation, affordability and stability to food; along with the new ideas of agency and sustainability proposed by the UN's Committee on World Food Security and Nutrition.[12]

Too often, 'food security' is less formally taken to mean secure access to staple foods. However, vitamins and micronutrients in nutrient-rich foods are also vital for healthy growth and development, and to prevent malnutrition. To emphasise the point, 'food and nutrition' security is referred to in this report and here we follow the USDA's definition of nutritional security, which is '...consistent and equitable access to healthy, safe, affordable foods essential to optimal health and well-being.'[13]

Resilient food systems

These are defined in this report as food systems that can adapt and remain functional throughout periods of stress and disruption. Resilient food systems should be able withstand or **resist** shocks, **recover** after disturbances, and proactively **reorient** to prevent problems from emerging. Further discussion on these terms may be found in Chapter 2.

*In this report, the term 'healthy diets' is based on the definition used by the World Health Organization.[10]

At the height of the COVID-19 pandemic, global food systems came under great pressure, requiring major government interventions.[2] Post COVID-19, the impacts from the conflict in Ukraine highlighted the fragility of food systems, even to distant events: affecting flows of commodities such as sunflower oil and wheat, and impacting the price and availability of natural gas used to create synthetic nitrogen for fertiliser. These factors contributed to rampant inflation in food and agricultural inputs that affected farmers and consumers alike. Conflicts, such as that in Sudan, have also seriously hindered agricultural production and humanitarian access, restricted movements of food commodities, and disrupted markets – in this case, severely reducing the availability and access to food for more than 21 million Sudanese people.[14]

It is now widely accepted around the globe that there is now an urgent need to transform food systems – so that they become resilient, equitable, sustainable, and deliver adequate nutrition. This is demonstrated by the many commitments made by 134 countries at the United Nations Food Systems Summit in 2021. At COP28, new ground was broken by a declaration on 'Sustainable Agriculture, Resilient Food Systems and Climate Action' now endorsed by 160 countries. At the same COP, a further group of countries (including Sierra Leone), created the Alliance Champions for Food System Transformation, committing themselves to be leaders in the field Most recently, The United Nations Committee on World Food Security has identified the creation of resilient food systems as a key priority for its 2025 programme of work.[15]

These commitments and declarations are clearly important, since they demonstrate a broad consensus and understanding of the need to transform food systems, and the political will to achieve that. However, the reality is that progress remains slow, with most LMICs and high income countries (HICs) having made relatively little progress. Meanwhile, the gap between the resilience of food systems in Africa, and the threats they need to manage, continues to widen.

1.3 A world becoming more uncertain and volatile

Today's global and industrial food system evolved during a period when international trade was expanding, and trade barriers were being dismantled. It also emerged during a time of relatively inexpensive and stable energy prices as well as relatively stable weather conditions. But while expanding trade, inexpensive energy and a relatively benign climate may have been present in the latter decades of the 20th century, no one expects these to be defining features of the 21st century.

Arguably, the last five years – marked by a global pandemic, significant economic volatility, and a rise in violent conflict – foreshadow the fact that the world is moving into a much more turbulent period of history where the impacts of climate change are expected to intensify along with less stable geopolitics. While the future can never be predicted with certainty, a key task within the present work has been to form a realistic view of the threats and risks facing food systems in Africa over the next two decades (see Chapter 3). These have been explored further in the three country chapters (Chapters 4–6). Key messages for all African countries are presented in Chapter 7, and for international and other organisations in Chapter 8.

The assertion that the 21st century may be entering an 'age of disruption' is of particular concern in Africa where small-scale farming dominates. Many African farmers cultivate relatively small plots of land, and a lack of quality inputs means they face substantial yield gaps†. Further, most of African agriculture is rainfed and therefore, vulnerable to changing climatic conditions which make rains less predictable. The capacity within Africa to adapt proactively and plan for disruptions is especially concerning given that the threats explored here are unlikely to arrive in isolation. For example, the emergence of major climate disruptions will almost certainly exacerbate and fuel geopolitical instability, which together may cascade to create economic shocks.

A critical priority for African countries, therefore, is to adapt and transform their food systems to cope with these challenges. However, this comes just at a time when resources to fund actions are particularly constrained, not least by the developing African debt crisis, high levels of inflation, and a multitude of competing priorities. This economic and political reality has been a central consideration within this project, and a key driver for evaluating how assistance from beyond national borders could be mobilised (see Chapter 8).

† Yield gaps are defined as the difference between what producers obtain from their harvests, compared with what they could obtain if they had the best available technology.

1.4 How the work was conducted – combining science with local realities

This report has been informed by the latest international science and evidence and has been peer reviewed by independent experts. The technical work was directed and managed by an interdisciplinary team of nine senior experts and officials: the Lead Expert Group (LEG). These included three international experts, together with a leading expert and a senior government official from each of the three focus countries (Malawi, Sierra Leone, and Ethiopia). The aim of this interdisciplinary team has been to integrate national and international expertise and insights and synthesise a comprehensive understanding of the challenges faced by these countries' food systems, and how the resilience of their food systems might be strengthened. The LEG was also responsible for ensuring the scientific quality and rigour of all the project's work. Management of the project was overseen by a Global Panel team in London.

Embedding the project findings in the social, political and economic realities of the three countries has been achieved by three means. First, the work has benefited from the involvement of diverse experts and stakeholders specifically from the respective countries, and under the direction of a LEG member from that country. This has enabled the project to capitalise on national expertise, and understanding of local circumstances and realities. Senior officials have also been closely involved in the technical work throughout as LEG members. These officials have provided important perspectives on the work, and have also connected the project with diverse ministries across their respective governments. Consultations with government ministers have also been conducted at critical stages in the project.

The organisation of the project's work has already yielded benefits for each country. The extensive engagement of experts and stakeholders has contributed to capacity building, building and strengthening networks, and refocused thinking on food-system resilience.

1.5 A report to challenge everyone

This report is first and foremost about action. It is divided into three parts:

Part I sets out the technical approach used in the project, and discusses the evolving global environment in which food systems need to operate. In doing so, it builds the case for urgent and decisive action.

- Chapter 2 discusses what is meant by 'the resilience of food systems', and how that translates to providing sustainable, healthy diets for all. It also presents a simple, but comprehensive, framework that has been used in this project to identify and plan policies and actions, mitigate trade-offs, and strengthen food-system resilience.
- Chapter 3 explores the depth of the crisis facing food systems across Africa, and the implications for both human health and the environment.

Part II presents the core of the project – an assessment of how the food systems in three African countries are faring in terms of resilience. The current situation in each is reviewed, and plans are set out for how their food systems can be strengthened to substantially improve the provision of sustainable, healthy diets for their populations.

- Chapter 4 – Strengthening food-system resilience in Sierra Leone
- Chapter 5 – Strengthening food-system resilience in Malawi
- Chapter 6 – Strengthening food-system resilience in Ethiopia

Part III looks across the three country chapters in Part II to assess what can be achieved, the potential shortfalls, and how that could be addressed.

- Chapter 7 reviews the findings for the three focus countries (Part II), drawing out messages relevant to other nations in Africa and beyond. It considers the gaps between what the three countries can feasibly do, and what is actually needed.
- Chapter 8 sets out key messages for other stakeholders, including the private sector. In so doing, it sets out priorities for what needs to occur beyond national boundaries – for example in regional and global bodies concerned with finance, trade, investment and development.

2 Framework – how to assess resilience

Key messages

Food systems are complex, dynamic socio-ecological systems that offer many places where interventions can create resilience to the environmental, political and economic shocks and disruptions that many expect to characterise the 21st century.[16] The aim of this report is to identify how potential interventions could be used alongside current efforts to transform national food systems, so that they become more able to deliver universal access to affordable and sustainable, healthy diets.

A natural starting point is to develop a common understanding of what is meant by 'food-system resilience'. Resilience in this context has many forms, reflecting the inherent complexity of food systems, and the diverse types of shock and disruptions that they need to withstand. This chapter begins with an overview of the diverse ways in which researchers apply the concept to their work. This shows that to be resilient, food systems need to (1) be able to withstand shocks – for the purposes of this chapter we call this 'resist'; (2) have the capacity to 'recover' after a shock; and (3) to anticipate and be able to proactively 'reorient' in response to changing conditions.

While these contrasting perspectives have value for policy makers, there is a need to create a path through this complexity. The second half of this chapter therefore draws these threads together in the form of a practical heuristic framework. This framework has been used throughout this report to think through and plan a coherent set of actions to strengthen food system resilience in the three African countries which are the focus of this work – Sierra Leone, Malawi and Ethiopia. The framework breaks down the challenges into five manageable dimensions of resilience (these may be described informally as 'lines of defence'). These map onto different parts of the food system, and broadly relate to different classes of stakeholder. Real-life examples are provided in each case.

2.1 The forms of resilience

The study of food-systems resilience is large and growing, having emerged as a distinct field in recent years. Recognising that it is a multi-dimensional concept, it can be viewed as exploring four core questions: Resilience of what? Resilience to what? From whose perspective? And resilience for how long?[17] To answer these questions, it is necessary to explore the capacity of a food system to ***resist*** shocks, a food system's capacity to ***recover*** after a shock, and how a food system can be structured to anticipate shocks and proactively ***reorient***‡ in response to changing conditions. The following paragraphs provide a review of the relevant academic literature that explores the background behind these three forms of resilience.

A second broad approach explores food-system resilience by considering different categories of shock.[18] This includes processes of global change – for example climate change, rapid urbanisation, population growth and demographic shifts such as population ageing. By contrast, 'unexpected shocks' might arise from natural disasters or political crises. Resilience is also sometimes a function of 'unexpected responses of food systems to these processes and events'. An example might be when consumers hoard food in response to perceptions of a problem in the food supply, or when countries stop exporting food to protect domestic consumers. Both tend to exacerbate the original problem, for instance by promoting the scarcity of staple products on the market.

Another approach to understanding the resilience of food systems is to take an explicitly global view, and explore how the global food system responds to, or adapts to, disruption through indicators of biophysical capacity to produce food, socio-economic access to food, and the diversity of domestic food production.[19] Using this approach, potential indicators to assess resilience include: potential yield (based on crop, climate and soil data); indicators on socio-economic access (which might include income, Gini coefficients, and education); and trade data (such as the dependency a country or region has to foreign imports either for food or for agricultural inputs such as fertiliser). Conducting such integrated assessments requires the explicit adoption of an interdisciplinary approach that links to earlier work on how food security is vulnerable to environmental shocks.[20,21]

Food-system resilience has also been explored through the lens of the COVID-19 pandemic. One study found that the impact of that shock was mostly felt in the form of lost income.[22] Another on COVID-19 in the Pacific region called for a bolstering of regional trade to enhance food system resilience while also considering how effectively urban and regional policy-making can help protect people from disruptions.[23,24] Taken together, this new evidence suggests that long-distance trade can be more vulnerable than local production, especially in the context of such widespread disruptions, and in situations where consumers lack economic power. Given deepening food insecurity and poverty in some regions and the expectation that the global food system is likely to experience more widespread disruptions over the next generation, then one of the lessons of COVID-19 pandemic should be a renewed interest and investment in local production as a complement to food traded over long distances – and at a scale that is meaningful in terms of local food demands. For many countries, developing a portfolio of food strategies that blend local and global approaches may be the optimal strategy.[25]

Many studies have focused not only on the resilience of food systems but also their adaptive capacity and vulnerability. For example, in the early 2000s, the resilience of socio-ecological systems and integrated adaptive frameworks were presented together, to further understanding of the ways that complex systems that appear stable, may collapse.[20,26,27,28] Analysis suggests that, over time, food systems may become less able to absorb or recover from shocks, that food-system resilience has biophysical, socio-economic, infrastructural and governance dimensions, and that systems that appear stable may rapidly stop functioning if the underlying conditions do not lend themselves to adaptive strategies. For example, if investments in high yielding and drought tolerant cultivars result in widespread adoption of those seeds, then there may be a commensurate drop in agro-ecological diversity, which may create new vulnerabilities to pest outbreaks that may find it easy to spread in simplified landscapes.

As noted in the opening paragraph to this section, one way of summarising this large body of evidence is to consider that there are different forms of resilience.[29] One approach to resilience, which is rooted in engineering, is to determine how well a system can ***resist*** problems, defined as how big a disturbance is needed before a system reaches a crisis or tipping point (sometimes this is referred to as robustness). The concept of resistance / robustness was originally applied to built infrastructure and used as a way of testing how much stress a building might tolerate before collapsing. Another form of resilience is the capacity of a system to ***recover*** after a crisis. This approach is often rooted in the ecology literature that explores how quickly it takes species to recolonise an area after a disturbance. More recently, resilience has been explored in terms of how to be adaptive or how to learn proactively, and anticipate problems. For this report, this form of resilience is referred to as its capacity to ***reorient***. While each of these forms of resilience is incomplete (e.g. if the people in a food system are already living in poverty, then how meaningful is their ability to recover after a problem?) resistance, recovery and reorientation each contain important elements of a broad conceptualisation of resilience.

‡ In this report the term reorient is taken to also include anticipating shocks.

2.2 Dimensions of resilience: Establishing 'lines of defence' along the food system

Although understanding the capacity of food systems to resist, recover and reorient help to unpack the concept of resilience, there is a need to apply these explicitly to the different aspects of food systems. As such, this report has adopted a heuristic 'lines of defence' framework designed to link these three forms of resilience with important nodes or functions within most food systems*. These dimensions directly encompass the various nodes of the food system from producer to consumer, and each illustrates one practical approach that those engaged in food systems may be able to use to resist and recover from problems, or to anticipate and proactively reorient to problems. They are:

1. Production resilience based on agro-ecological conditions;
2. Value chain resilience based on economic characteristics and infrastructure;
3. Consumer and household resilience based on livelihoods and assets;
4. Community resilience based on social capital and civil engagement; and
5. Institutional resilience based on governance and safety nets.

By laying out these dimensions of resilience as 'lines of defence', this framework draws explicitly on a sustainable livelihoods approach, and works on asset mapping, capitals and capabilities.[32,33] Importantly, this approach has been used here to illustrate how actions that affect one of the five dimensions may interact and have secondary impacts on others. In so doing, it illustrates how different policies or programmes may necessitate trade-offs or have unintended impacts on different parts of the food system.

Dimension 1: Production resilience based on agro-ecological conditions

This dimension concerns food production and harvesting: understanding how the production systems and agro-ecological practices employed by farmers, is crucial to assessing how a food system may resist, recover or reorient in light of shocks and disturbances. For example, in Malawi, Ethiopia and Sierra Leone smallholder agriculture dominates yet there is a transition to larger more commercial operations under way. As much as these changes may affect the agro-ecology of the three countries, this may affect the different forms of resilience. For example, some food-producing landscapes and seascapes are extremely resilient, meaning they remain productive even during major disruptions, whereas others are very vulnerable. However, a study of historic famines found that agro-ecosystems low in crop diversity and with relatively simple landscapes are more vulnerable to environmental change events.[30] The Irish Potato famine, the US Dust Bowl, and the Ethiopian famines of the 1980s all occurred in landscapes where only a small number of crops were cultivated and where the landscape had lost both spatial and temporal diversity as farmers traded off resilience for productivity. This trade-off between stability and productivity has been a feature of several studies that show how human management for production can come at the expense of food system resilience.[34]

These and other examples show how agro-ecosystems with rich biodiversity, healthy soils, abundant water, and landscape heterogeneity typically fare better during shocks such as droughts and/or pest outbreaks.[34] Such systems also typically recover faster due to, for example, better retention of soil moisture. Therefore, intervening at the farm level to support farmers in adopting management practices that achieve these agro-ecological qualities can help build the capacity to remain productive or recover after environmental shocks.

Recent work on both marine and terrestrial food producing systems shows that the process of managing these ecosystems for enhanced productivity risks undermining resilience to climate change.[35] There is an important potential trade-off in that if farm level interventions are expensive (e.g. improved irrigation or drought-tolerant seeds), then only relatively wealthy farmers may benefit; this may displace smaller farmers and ultimately reduce community and household level resilience (see dimensions three and four).

Dimension 2: Agri-food value chain resilience

This dimension relates to the value chain that links producers and consumers. It has both economic and infrastructural elements. This is because in most parts of the world, including the three countries featured in this report, food is largely treated as a traded commodity based on market mechanisms.

In terms of infrastructure, the key elements of the supply chain are transportation, food processing, storage and retail environments. Ethiopia, Malawi and Sierra Leone are typical of many low- and middle-income countries (LMICs) in that there is a general lack of access to adequate facilities for post-harvest storage. This means that considerable amounts of food are lost to pests and diseases before reaching the consumer.[35,36,37] Understanding these food-system components is crucial to building resilience. This is because, as well as producing food, a major part of economic activity in lower- and middle-income countries lies in the production, aggregation, processing, distribution and marketing of food. The aggregate value of the food sector to the economy is, in general, much larger than the value of the primary production sector. In addition, imported food may be specifically vulnerable to external shocks.

The vulnerability of supply chains has, in recent years, come under intense scrutiny as external shocks, mostly notably Russia's invasion of the Ukraine and the effects of the COVID-19 pandemic.[38] These challenges have intensified over the 2022-24 period with conflicts in Gaza and Sudan (among others) directly impacting both food systems and access to sustainable, healthy diets for more than 27 million people.[39] It has been argued that corporate concentration within global food systems in the past

*This draws, in particular, on interdisciplinary frameworks, already published.[29,30,31]

Feed Salone, Ministry of Agriculture and Food Security

15 years '…heightens vulnerability to worldwide food crises that have profound consequences for the world's most marginalised populations'.[40]

This builds on work studying the social determinants of historic famine such as a series of famines that affected SE Asia during the late Victorian period, and the Irish Potato famine. In the former, rail lines and telegraphs were originally intended to help colonial managers cope with crop failure.[41] The logic was that, if crops failed in one region, then telegraph lines could help alert authorities in other regions of a looming problem. These same authorities would then ensure food was shipped into struggling jurisdictions. Unfortunately, poverty and a lack of political power meant this infrastructure was in fact used in crises to allow food from impoverished areas to flow to regions where consumers were able to afford higher prices. A conclusion from this body of work is that, in the absence of political and economic power, supply chains within food systems can inadvertently undermine resilience rather than protecting consumers.

Dimension 3: Consumer and household resilience based on human and financial capital

Evidence drawn from livelihoods data show families all over the world, but especially in LMICs such as Malawi, Ethiopia and Sierra Leone, who have substantial human and financial capital are both more robust as well as being better able to recover or reorient their livelihood to many kinds of shocks.[42,43] (Here an example is a supply side shock such as a drought that causes a crop failure, or a demand side shock such as an economic issue that reduces incomes and where people tend to purchase less nutritious foods.) This builds explicitly on the idea that households, when confronted with a challenge (such as the loss of a job or the failure of a crop), will deploy social, human, natural and political capital to adapt.

In some well documented cases, these adaptations can cause problems in the longer term. For instance, a common response to a crop failure that harms long-term resilience may occur if a farming family consumes seeds or breeding/planting stock that should have been held in reserve for the next growing season. Similarly, selling productive assets and tools such as draught animals and farm implements to address shortfalls in food or income also undermines the long-term viability of households during moments of crisis.[44]

While there is a consensus that poverty is a major problem when it comes to creating resilient food systems, addressing poverty alone can lead to mixed nutritional outcomes. Studies on the 'dietary transition' show how households in LMICs are moving towards diets that are higher in ultra-processed foods; while research on the 'triple burden of malnutrition' shows households in LMICs being simultaneously exposed to both the health problems of traditional under-nutrition and rising rates of chronic illness such as obesity and diabetes.[11] This shows that action to reduce poverty may, by itself lead to undesirable consequences for diets and human health, unless accompanying preventative action is undertaken. This discussion also references the challenging assertion that for many small-scale farmers, there may not be any viable pathways out of poverty through farming. For many farmers (and particularly very small-scale farmers), trying to 'hold' onto a farm-based livelihood offers little more than a persistence of poverty, and in fact the best strategy for them is to exit farming. However, this proposal assumes there are decent non-farm options available, which is a discussion beyond the scope of this report.[45,46]

Finally, it is important to note that there are numerous interactions between the five dimensions of resilience outlined here. For example, poverty may be ameliorated by social safety nets and social protection, which is a function of government intervention and programming. Further, as studies in Malawi show, many smallholder farmers' lives are characterised by poverty and food insecurity. Studies have shown that they are unlikely to switch agricultural production from staples such as maize to more nutritious crops, unless any such shift has immediate benefit in terms of satisfying hunger.[33,34] Hence, in this report the need to address poverty and how social protection must play a role is highlighted (see the fifth dimension of resilience below). In the long-term, social protection programmes should not be seen as competing with food system resilience policies; rather social protection is a vital component of building food system resilience.[47,48]

Dimension 4: Community resilience based on social capital, civil society, and built infrastructure

A substantial amount of food-system resilience is mobilised at a community level, for example, involving neighbours and community groups rallying during times of need to help each other.[49] This has led to a robust literature on both *bridging* and *bonding* social capital. Here, bonding social capital comprises the ties that bind community members together in solidarity and mutual support. By contrast, bridging social capital encompasses those social connections that link one community to other communities. Bonding social capital helps

find adaptive strategies from within a social network; bridging social capital helps communities access help from outside. Some also talk about 'linking' social capital as a way of describing norms of reciprocity and trust.[50] There is now a consensus that communities with well-developed social and built infrastructure, functioning civil society organisations, lower crime rates, and access to services have better capacity to mobilise collective responses to challenges.[51]

These dynamics have been observed in diverse contexts, including for example, research on social capital in 20th century America, and on the links between community-based organisations, resilience and food security in rural Kenya.[49,52] In the latter, although there was a robust network of community-based organisations working to create more resilience and food security in the country, poor quality infrastructure for food distribution (second dimension of resilience in this framework) and a lack of capacity among governmental officials (fifth dimension of resilience) undermined the work being done at the community level. This study also concluded that community-based organisations play a major role in food system transformation, and are a vital component of a resilient food system. One implication of this work is that investments at the community level need to be matched with investments in the other dimensions of resilience – such as capacity building for the public service (that here would be characterised as investments in the fifth dimension of resilience) and better-quality food processing and distribution infrastructure (that might be viewed as an investment in the second dimension of resilience).

Dimension 5: Institutional/state government resilience based on social safety nets, early warning systems, and functioning governance

This dimension of resilience concerns the role of formal institutions, mostly notably national governments, but also the development and donor community. These organisations are critical in boosting food system resilience, for example by providing access to social safety nets, weather monitoring, crop insurance, strategic food reserves, humanitarian assistance and connections with international donors. In other words, when problems extend beyond the scope of a household or community, or even a nation state, these large institutions are used to mobilise proactive and reactive responses. Another key element of institutional resilience is the ability to anticipate threats and challenges on the horizon, and to plan for them. Finally, as noted above, investments at the community level need to be matched with capacity building for public services.

Social safety nets have a particularly important role to play within food systems. It is infeasible, and potentially prohibitively costly, to engineer food systems so that they can cope with every eventuality. There is always the possibility of an unpredictable extreme event or combination of events which could overwhelm the system for a period. Safety nets provide a failsafe to protect the most vulnerable, when all else fails. However, they inevitably have costs associated with them. There is therefore a trade-off to be made, between resources spent on strengthening the resilience of food systems to a given level, and allocations reserved for safety nets.

2.3 Understanding these five dimensions as 'lines of defence'

By combining the three forms of resilience (resist, recover, and reorient) with the five dimensions (see Table 2.1), this report adopts a relatively simple strategy to provide a coherent and comprehensive framework for policy makers to consider options for strengthening the resilience of their food systems, and on which to 'hang' policies and actions. These have proved both useful and effective in the work reported here. However there are several caveats for use of the framework.

- First, policy options need to be considered through the lens of the specific threats that may affect a given food system in the future (see Chapter 3, and the three countries Chapters 4-6).
- Secondly, as explained, individual policies and actions may have unintended consequences that need to be thought through, and trade-offs that need to be considered and resolved. More generally, actions affecting one dimension of resilience may have secondary impacts on others.
- Thirdly, it is a mistake to consider each of the five dimensions of resilience in isolation from each other. Food systems comprise a complex set of interconnected parts. So the dimensions need to work together to enable food systems as a whole to continue to function at times of crisis. Tackling an isolated weak link is not enough. This has been a particular challenge for each of the three focus countries in this report (see Chapters 4-6).
- Consideration needs to be given to the many constraints on LMICs which may prevent them from adequately strengthening their food systems without external action, and possibly assistance. This may be due to inadequate local resources, or due to external factors beyond their control. Chapter 8 therefore considers wider policies and actions which may go beyond national governments.

Table 2.1: Potential ways in which interventions in the five dimensions of resilience could help food systems to resist, recover, and reorient in the face of threats. Such a mapping may be used to identify gaps and opportunities for action

Three forms of resilience	Examples of interventions within the five dimensions of resilience				
	Agro	Household	Community	Supply chain	Institutional
Resist	Farms with wind breaks and soils high in organic matter can remain productive even under adverse environmental conditions.		Communities with high levels of solidarity are better able to help each other during crises.	Good local infrastructure can help food-system functioning during global shocks.	
Recover		Households with savings and access to affordable credit can restart livelihoods after problems.		Robust built infrastructure is able to start functioning quickly after problems.	Institutional support to households and families can help food systems restart after crises.
Reorient	Community seed banks with a range of cultivars can give producers access to cultivars suited to changing climates.	Families with high levels of human capital (e.g. education and health) are better able to anticipate and plan for problems.			Weather and market forecasts can alert local communities to the nature of problems before they emerge.

Source: Authors

2.4 Conclusion: Strengthening food-system resilience – weighing threats and trade-offs and understanding the political economy of food systems

One important lesson from decades of agricultural development work, is that policies and interventions are never politically neutral; often the decision to invest in one aspect of a food system reflects dominant political hierarchies. For example, the promotion of mechanisation and other Green Revolution technologies such as hybrid seeds and chemical fertiliser in the mid-20th century led to significant increases in crop yields. The same processes, however, also resulted in widespread poverty for smallholder farmers unable to afford new technologies and significant environmental problems.

The political economy of the Green Revolution has been well reviewed in the academic literature, and from this the lesson can be drawn that policy makers need to be very clear on how to determine who benefits, how policies and programmes will affect smallholder farmers, and how to maintain strong environmental protections.[53] To make these concerns visible, the 'five dimensions of resilience' framework has been used throughout this report to explore how interventions in one part of the food system may lead to trade-offs, or unintended impacts on different parts of the food system. Inevitably, developing strategies, programmes and policies when future conditions are fundamentally uncertain is particularly challenging.

The following sets out important considerations, all of which involve trade-offs related to the political economy of food systems. (Note: the practical application of these, and how in-country practitioners weigh up associated trade-offs is discussed in Chapters 4-6):

- ***Strengthening resilience in food systems inevitably has an associated cost, which needs to be weighed – both against the potential benefits, and the costs of not acting.*** Such costs may entail a single investment, for example building a grain reserve. But other costs may be ongoing, such as the costs associated with maintaining the reserve. Not all costs are readily quantifiable. For example, there may be the political 'cost' incurred in justifying expenditure to prepare for a drought which may not occur. But conversely, there may also be a political cost of not acting – as and when a drought strikes.

- ***Almost any approach designed to protect against one type of threat may cause vulnerabilities in another – these need to be thought through.*** For example, it is not simple or straightforward to balance benefits and vulnerabilities nor how to be protected by both global and local shocks at the same time.

Russia's invasion of Ukraine in 2022, for example, triggered a shortage of about 30 million tons of grain in Africa, along with a sharp increase in cost. Six countries (Eritrea, Egypt, Benin, Sudan, Djibouti and Tanzania), previously imported over 70% of their wheat products from the region, and were therefore particularly affected by this disruption.[54] However, shifting the food supply in favour of local production could increase vulnerability to other risks – such as a drought or flood affecting the region, local conflict or regional plagues of pests. Here, disruption would be especially concerning for local consumers who become more reliant on local production, and with limited access to markets that draw from wider areas. In this example, trade – and in particular international trade – may help spread the risks of supply chain disruption. More generally, there are many circumstances when food systems based on trade are more resilient than local ones.[30]

- ***Policy makers need to assess who benefits when making choices.*** An example concerns how much emphasis to place on farm-related policies, designed to protect producers from economic or environmental volatility, versus ensuring vulnerable consumers have access to social protection interventions.

For instance, incentive programmes to help farmers adopt 'climate smart' farming practices may help build up soil organic matter and make farms more resilient to droughts (since organic matter acts like a sponge in the soil, trapping water when it is abundant, and saving it for when it is needed). But such programmes will only have a tangential impact on improving maternal, natal and neonatal nutrition – an important factor for developing and maintaining robust immune systems. So in this case, a policy maker would need to balance improvements in agro-ecological health, which help protect against the effects of climate change and other environmental threats, with the provision of sustainable, healthy diets, which help make people more resilient to disease. More generally, any attempt at planning for food systems resilience must take into account the lived experiences of the people on the ground so that planning done in a 'top-down' mode at national or international levels is grounded in the needs of the people who are the intended beneficiaries.[55]

- ***Policy choices need to be thought through using a broad view of the latest science and evidence.*** An example here relates potential catastrophic impacts of novel livestock diseases such as African Swine Flu or highly pathogenic Avian Influenza. Either of these diseases may cause widespread disruption, human and animal suffering, and drive a major economic and health crisis. Enhanced biosecurity protocols, and a much more robust infrastructure would help to protect livestock production from emerging pathogens.

Building biosecure facilities where livestock are prevented from interacting with wildlife (assuming funding is available for those), may, however, act to marginalise small scale producers who rely on low-intensity livestock production as a vital livelihood strategy and a source of nutritious food. Such a change may also have significant implications for African women who manage most of the small-scale livestock production as there is good evidence to show that they often cease being involved when it becomes more commercial and capital intensive. For example in Botswana, evidence shows that men took over the production of chickens as the sector became more commercial.[56] Here, a strategy to protect against zoonotic disease threats would risk removing a vitally important source of income and nutrients on which many poorer, female producers rely.

- ***Potential trade-offs between food security and better nutrition.*** Often, conversations about food security implicitly focus on whether a population has access to adequate dietary calories, rather than whether a population has access to better nutrition. The former often focuses on relatively inexpensive and durable carbohydrates (grains and oilseeds) while the latter often focuses on more expensive and perishable produce. For example, a study in Malawi shows that resource-constrained households unsurprisingly prioritise alleviating hunger rather than boosting dietary diversity.[47,48] Hence, any conversations about how to boost the resilience of food systems to shocks, must also take into careful account the need to also maintain better nutrition.

3 Building resilience in food systems in sub-Saharan Africa – emerging threats

Key messages

This chapter focuses on the threats facing food systems across Africa. They pose a formidable challenge due to their diversity, and evolving and often intensifying nature. Added to this is the new reality that threats including climate change, conflict and geopolitical upheaval, do not operate in isolation but intersect, amplifying their impact. Demographic change in Africa will add further pressures, both on food systems, and the environmental systems on which agricultural production depends.

Many countries are already taking active steps to strengthen the resilience of their food systems. However, the overall picture is a mixed and deeply concerning outlook. Across the continent, countries are striving to transform their food systems, but progress is slow and the gap between likely threats and their level of resilience is widening. Measures to address that shortfall are urgently needed both at the national level and internationally and are set out in subsequent chapters.

3.1 The evolving threats to African food systems

Food systems in Africa operate within a global environment, so a natural starting point is to consider how the global risk environment is changing. Policymakers in Africa will be well aware of the current risks facing their national food systems and the legacies of pre-existing agricultural production, distribution, and consumption. Therefore, the focus here is on the future.

This chapter starts by taking a broad view of future risks, and then focuses on four which are considered to be particularly concerning. These relate to agricultural pests and diseases, violent conflict and insurgencies, economic instability, and climate change. However, in considering these, it is important to recognise that Africa's food systems will also come under additional pressure in the future, as they struggle to service the needs of the continent's burgeoning populations (see Box 3.1).

A number of surveys and studies have considered the range of global risks for different time horizons, and provide an important resource for policy makers concerned with food-system resilience. For example, a survey of perceptions of global risks, commissioned by the World Economic Forum draws on nearly 1,500 global leaders across academia, business, and the international community.[57] For climate change, a gold standard in assessing future risks and their potential impacts are the reports of the Intergovernmental Panel for Climate Change.[58] For the wider environment, the OECD has developed projections for what demographic and economic trends might mean for the environment, in the absence of more ambitious green policies. It focuses on four areas: climate change, biodiversity, freshwater and health impacts of pollution.[59] The United Nations has also considered the possible trajectories of armed conflict out to 2030.[60]

While these studies and projections do not provide a definitive view of the future, they can provide helpful insights for policymakers who are considering the evolving risks from threats in their own countries and beyond. Table 3.1 tabulates many which are considered important. Overall, they paint a predominantly pessimistic global outlook over the near term, which is expected to worsen over the next decade. For African food systems, which are typically less industrialised and characterised by value chains with a lower level of processing, fewer intermediaries and more direct transactions between producers and consumers, the challenges are even more significant.[66] It is beyond the scope of this project to undertake a detailed review of all major risks to African food systems. However, the following section focuses on four areas that are particularly important.

Box 3.1: Demographic shifts will add considerable pressure on Africa's food systems

Africa's population is projected to rise from just over 1.5 billion in 2024 to over 1.8 billion in 2035, and could reach 2.5 billion by 2050.[61,62] By then, more than a quarter of the people in the world will be African. Of the eight countries accounting for more than half of global population growth between now and 2050, five are in Africa: the Democratic Republic of the Congo, Egypt, Ethiopia, Nigeria, and the United Republic of Tanzania.[63]

These population increases will add considerably to the pressures on Africa's food systems – not just from the greater numbers, but also from shifting diets as populations become wealthier. Increases in per-capita consumption of meat and other foods with relatively high environmental footprints are likely. By 2050, the World Bank estimates the demand for meat and dairy in sub-Saharan Africa will increase by 327% and 270% respectively, compared with 2012 levels.[64] Pressures on environmental services will also increase – for example, through deforestation and repurposing of land for food production, use of freshwater resources, and threats to biodiversity.

While meeting these additional demands, African food systems will also need to cope with a major expansion of Africa's *urban* populations. These are projected to reach 1.2 billion by 2050 – an additional 600 million people.[65]

Table 3.1: Potential global risks, and risks over the next 10 years

Economic	Environmental	Geopolitical	Societal	Technological
Inflation	Extreme weather events	Interstate armed conflict	Involuntary migration	Misinformation and disinformation
Economic downturn	Critical damage to Earth systems	Geoeconomic confrontation	Societal polarization	Cyber insecurity
Contagion of financial instability	Non-weather related natural disasters	Inter-state confrontation over access to natural resources	Organised crime	Censorship and surveillance
Debt and currency fluctuations.	Biodiversity loss and ecosystem collapse	Interstate violence	Lack of economic opportunity	Technological power concentration
Concentration of strategic resources	Natural resource shortages	Biological, chemical or nuclear hazards	Erosion of human rights	Adverse outcomes of frontier technologies
Disruptions to a systemically important supply chain	Pollution	Terrorist attacks	Infectious diseases	Adverse outcomes of AI technologies
Disruptions to critical infrastructure	Water shortages	State backed cyber attacks	Chronic health conditions	Displacement of labour by robotics
Labour shortages	Agricultural pests and diseases	Export bans by major food producing nations, and fragmentation of global trade more generally	Insufficient public infrastructure and services	
Asset bubble bursts		Changes in migration law that affect the ability to recruit labour into agricultural sector, and restrict seasonal migrant workers	Unemployment	
Illicit economic activity			Violent extremism	

Source: This illustrative table has been generated by experts during the project

3.1.1 Agricultural pests and disease

Agricultural pests and diseases pose severe threats to Africa's food systems. Some of the most destructive transboundary plant pests and diseases encompass large grain borers, fruit flies, locusts, cassava and banana diseases, wheat rusts and fall armyworms (see Box 3.2).[67] Past epidemics and pandemics of plant diseases include: maize lethal necrosis disease, yellow dwarf disease of wheat, sweet potato virus disease, banana brundy top disease, and tomato brown rugose fruit disease. Animal diseases with high impact include African swine fevers, foot-and-mouth disease, and *peste des petits ruminants*. Also, seed borne diseases and insects affect stored produce such as grains, resulting in heavy losses. Besides affecting the price and availability of foods, these pests and diseases threaten the livelihoods of farmers, particularly sub-Saharan Africa's estimated 33 million smallholder farmers who contribute up to 90% of food production in some countries.[68]

It was reported in 2022 that pests and diseases in Africa led to annual crop and food losses estimated at US$65.5 billion.[69] This includes US$29.06 billion for yield loss, US$36.34 billion for weeding, and US$0.17 billion for losses in livestock-derived income. Approximately one-sixth (16.7%) of farm productivity losses in Africa are due to crop pests.[70] The spread of pests and diseases is driven in part, by today's increasingly globalised supply chains that create new vectors for pathogens to move.[71] Most pathogens that have affected crops in Africa, especially cereals, will continue to impact food security and diet quality.[72] Also, warming temperatures will stimulate the spread of new pathogen strains that are adapted to changing climatic conditions.[72] This combination of factors suggests that trade and climate change may combine to amplify the risks of pests and diseases.

Box 3.2: Nearly all of Africa's maize crop is under threat from pests[74]

Following the first observations of the fall armyworm in 2016 in Nigeria, the threat has grown – almost 92% of Africa's maize-growing areas suffer from year-round growth of fall armyworm.

Of major concern is that 95% of the crop is grown in areas which are climatically suitable for fall armyworm and at least three or more pests such as the maize stalk borer, Western corn rootworm and Asiatic witchweed. Over half (52.5%) of the African maize area considered susceptible to fall armyworm is at further risk from another nine pests, while over a third (38.1%) to another 10 pests.

All of this means that greater deployment of signalling to warn of diseases, and disease monitoring and prediction, are urgently required to manage the evolving threat and limit the risk of outbreaks.[72,73] Such surveillance tools need to include sensors for pathogens, and models that simulate and predict how climate changes may affect pest distribution. At present, however, animal disease surveillance systems (ADSS) are currently poorly funded, and only produce limited data on disease status and trends.[71,74] They need to be urgently improved to ensure early detection of epidemics and outbreaks. Better sensitivity and coverage are also required and they need to be designed in a way to reduce the costs associated with disease surveillance. These steps will not only help improve the resilience of livestock systems to emerging pathogens, but also promote human health through the early detection and control of zoonotic disease (see footnote**).

3.1.2 Violent conflict and insurgencies

In recent decades, Africa has experienced many violent conflicts, insurgencies, and civil wars. Conflict and insurgencies are frequent precursors of food insecurity, malnutrition and degraded food systems.[75,76,77] Such events have been directly linked to food crises and insecurity in Uganda, Burkina Faso, South Sudan, Cameroon, Somalia, Central African Republic, Rwanda, Chad, Nigeria, Democratic Republic of Congo, Mali, and Ethiopia.[77]

Although Africa is witnessing a decline in major wars, smaller conflicts, including insurgencies, seem to be growing, both in number and intensity and this may provide particular challenges to food systems.[78] Electoral violence and violence over access to critical livelihood resources, are likely to continue. And while the global prevalence rate for conflict is predicted to dip from 15% to 7% by 2050, this is less likely to occur in sub-Saharan Africa because of high poverty levels, weak state capacity, low economic growth, and high dependence on natural resources.[79]

A 2022 report estimated that 111 million people facing acute food insecurity in Africa were in countries experiencing conflict.[80] Also, it was estimated that conflict caused US$ 3.7 billion in agricultural losses in northeast Nigeria alone in 2016.[81]

Armed conflict impacts nearly all aspects of a nation's food system, including production, processing, distribution, and marketing. Some of the most significant effects include the destruction of productive assets (e.g. farmland, forest, livestock, storage and processing facilities), displacement or forced migration, and loss of lives.[82] For example, the number of battle-related fatalities from armed conflict incidents in sub-Saharan Africa increased between 2020 and 2022 from 10,385 to 112,726.[83,84] The number of internally displaced people in Africa due to armed conflict has also increased from two million to 10 million in the last two decades, reaching 13,456,370 in 2023.[85]

Forced displacement and other spillover effects due to armed conflict also reduce food security in countries or communities not directly suffering conflict.[86] Farmers, and others involved in different aspects of food systems, have also suffered from mental health-related issues arising from exposure to armed conflict and wars.[87,88]

As noted in Chapter 1, wars in distant regions, such as the Ukraine-Russia conflict, also pose significant threats to food systems in Africa: importation of food, fertiliser, and energy supplies is vulnerable to disruption. Food availability and affordability are also frequently adversely affected. The conflict in Ukraine triggered a surge in global food and fertiliser prices, driving the UN's Food Price Index to its highest recorded level in March 2022 since its inception in 1990.[89] The Russia-Ukraine war also affected the consumption of nutritious foods. As food prices increased, low-income families purchased more staple foods, resulting in malnutrition and other health challenges.[90] The war and associated sanctions on Russia and Belarus, has also disrupted fertiliser prices and supply chains.[89]

Conflict also interacts with other threats. For example, the effects of climate change may lead to new human migration patterns that in turn, may cause cultural or ethnic tensions to flare up. Conversely, conflict can itself give rise to displaced people, and when they are accompanied by livestock, new disease vectors may be created.

**The creation of an effective Animal Disease Surveillance System could reduce the emergence of infectious diseases such as monkeypox across Africa, leptospirosis in Tanzania, Marburg virus in Ghana, anthrax in Sierra Leone, or hepatitis E in Southern Sudan, amongst other reported ongoing zoonotic outbreaks.

3.1.3 Economic instability

Economic development is seen as an effective tool for increasing food security and diet quality, enhancing the quality of life, and eliminating poverty.[77,91] Economic instability, however, characterised by high levels of debt, inflation, and unemployment affects every facet of a country's national life. The recent experience of many African countries demonstrates how the debt profile of a nation influences its economic stability, along with inflation, food and commodity prices, and currency depreciation. Economic instability, particularly rising debt profiles and inflation, makes it more difficult for African countries to transform their food systems, to strengthen the resilience of those systems, and to deliver access to diets that are sustainable and healthy.

Public debt in Africa has risen rapidly over the last 20 years. Sub-Saharan Africa had a total external debt stock of US$702.4 billion in 2020 compared to US$380.9 billion in 2012.[92] The amount owed to various creditors, ranging from multilateral lenders to government and government agencies, rose from about US$119 billion to US$258 billion.

Sub-Saharan Africa's public debt expressed as a ratio to Gross Domestic Product, has increased from approximately 50% in 2019 to 57% in 2020.[93,94] One-third of SSA countries had debt levels above 70% of GDP (see Figure 3.1) and Africa's total external debts (expressed as a share of export earnings) increased from 74.5% in 2010 to 140% in 2022.[57] Overall, the outlook for the entire continent is one where the debt profile is unsustainable.

For food systems, high levels of debt may cause a depreciation of currencies in highly indebted countries, and this in turn could increase the price of the food imports many African countries depend on. Again, it is important to note that crises may also interact. For example, if a debt-currency shock that causes food import prices to rise happens at the same time as a climate shock hurts domestic production, then countries may very quickly find themselves in the midst of a food crisis that cascades out of control.

Of particular concern are the countries that the IMF-World Bank Debt Sustainability Assessment describes as problematic in terms of debt. For example, according to the IMF the following countries are 'debt-stressed': Republic of the Congo, Zimbabwe, Sao Tome and Principle, Zambia, Ghana, and Malawi. Countries considered at 'high risk' included Burundi, Cameroon, Central African Republic, Comoros, Ethiopia, and Gambia. Meanwhile, Benin, Burkina Faso, Congo DR, and Cote d'Ivoire, among others, were considered low risk. Given that many of these countries are both exposed to climate change and dependent on food imports, building the resilience of their food systems should be seen as of paramount importance.

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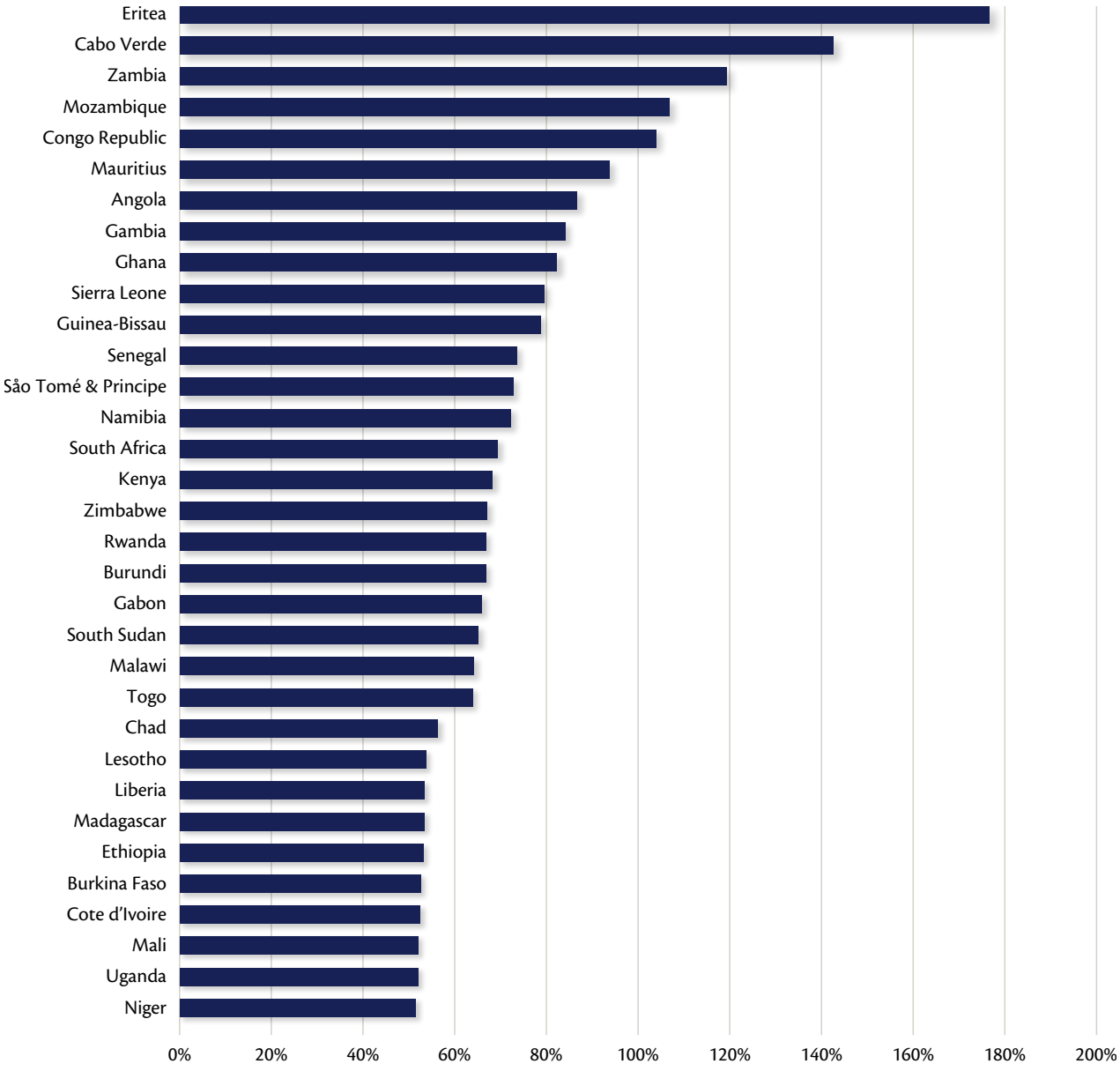
Figure 3.1: Sub-Saharan African countries with government debt-to-GDP ratio greater than 50% in 2021



Source: Were (2024) illustration based on IMF (2022) data.[101]

The IMF is also concerned that this situation may worsen and that over the next decade, many African countries may fall into what the IMF calls 'debt distress'. This means that the ability of these countries to service their debts may falter, leading to defaults as is currently the case in Zambia and Mozambique. According to IMF-World Bank's Debt Sustainability Analysis (DSA) Guinea-Bissau, Togo, Ghana, Ethiopia, Sierra Leone, Kenya, Malawi, Mozambique, The Republic of Congo, and Zambia are all in debt distress or at risk of debt distress††.[95]

Debt distress, economic recession, inflation and currency depreciation, reduced government investment in other sectors of the economy, increased poverty and inequality, and social unrest are some of the worst-case implications of the threat of rising external debts. The relationship between high debt, inflation and currency depreciation[96] can lead to a vicious cycle starting with high debt, leading to inflation, which in turn triggers currency depreciation. These two factors can impair the ability of countries to service their debt, leading to higher debt levels, an unsustainable debt profile and potential economic instability. An unsustainable debt profile will mean a government is less likely to be able to invest in agricultural development, social protection programmes and other areas of the food system because of the costs of debt servicing. Inflation and currency depreciation in a country that is a net food importer will also lead to rising food prices, and greater food and nutrition insecurity.

†† The three countries that are central to this report are included in the list of those that are either in debt distress or may fall into this situation.

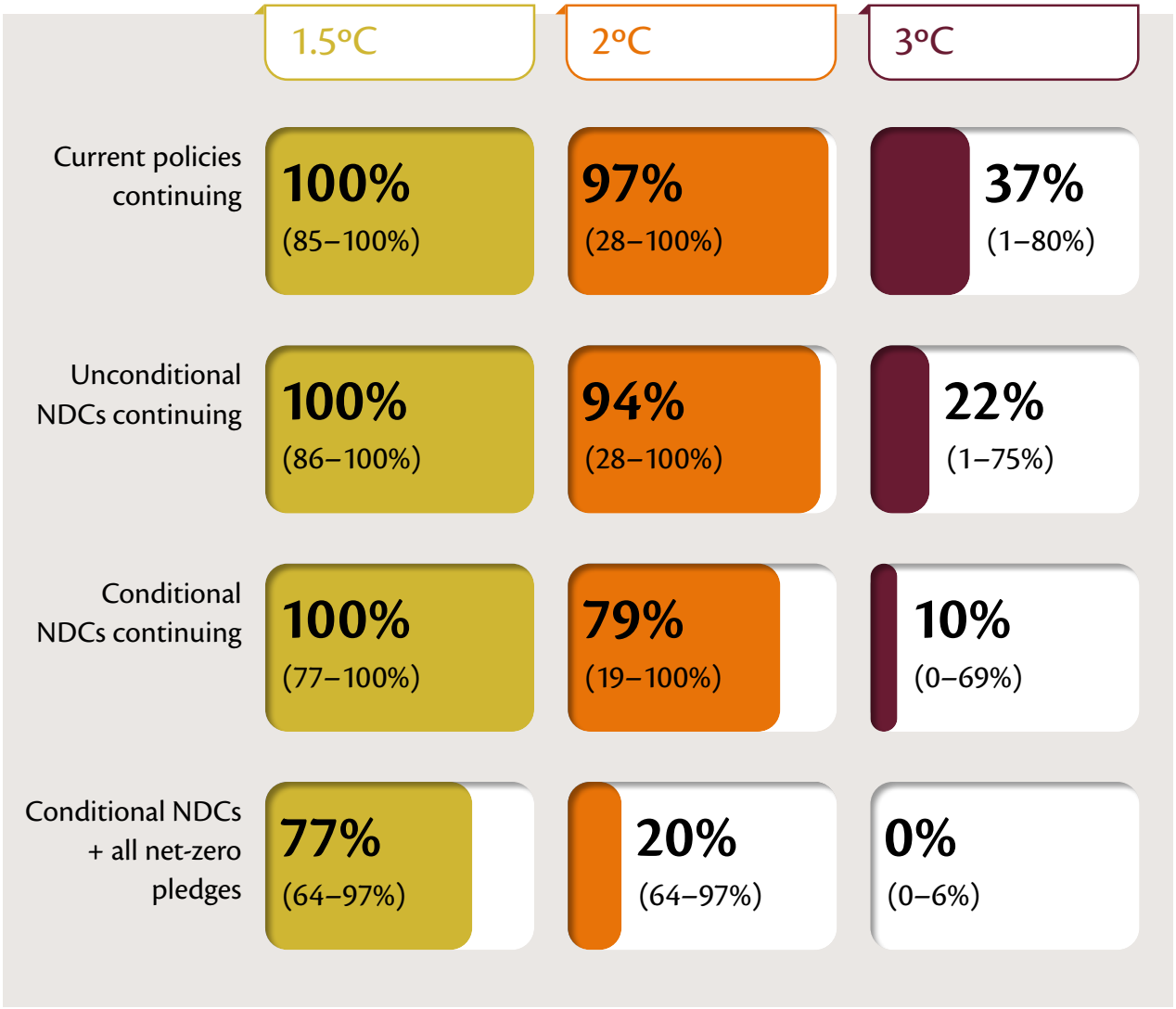
3.1.4 Threat of climate change

Human activities are estimated to have caused 0.8 to 1.3°C of global warming, with a best estimate of 1.07°C, higher than the pre-industrial levels.[97,98,99] Food systems have contributed significantly to climate change by producing approximately one third of greenhouse gas emissions globally[8,100].

At COP 21 in 2015, 196 countries adopted the 'Paris Agreement'. The goal was to hold global average temperature to well below 2°C above pre-industrial levels, and try to limit the temperature increases to just 1.5°C. Since then, progress has been insufficient and the 1.5 degree threshold has already been breached for a full year. Moreover, the 2024 UN Emissions Gap Report, which was tabled as part of COP 29, shows the window to limit warming consistent with the Paris Agreement is closing fast. This report argues that unprecedented cuts to GHG emissions are needed and that commitments already agreed to reduce emissions, will not suffice. Indeed, if all current nationally determined contributions (NDCs) are implemented, and no further ambition is shown, then in all likelihood 2.6 degrees of warming will be experienced by 2100. Furthermore, although COP 29 resulted in developed countries agreeing to US$300 billion per year (by 2035) in funding for developing countries to finance climate change programmes, this fell far short of what was requested by the latter.

Figure 3.2 shows what policy makers can expect under different policy 'scenarios', assuming that commitments already agreed to are fully delivered. However, the reality is that GHG emissions in 2023 grew year-on-year by 1.3%. Whatever the expectation of future delivery of NDCs, there is a clear need for food systems to be strengthened to be resilient not just to 1.5 degree of warming, but to at least two degrees. Other studies affirm the urgency of the situation. For example, if 2023 GHG emission levels continued for just six more years then there will only be a 50% chance of keeping warming to within 1.5°C.

Figure 3.2: The likelihood of warming exceeding 1.5, 2 and 3 degrees Celsius for different NDC scenarios[102]



Source: United Nations Environment Programme (2024). Emissions Gap Report 2024 [102]

Different scenarios project that climate and weather variability will increase as the planet warms, leading to changes in the frequency and severity of extreme climate events.[103] Notable extreme climate-related events in sub-Saharan Africa include drought, prolonged dry spells, and floods.[104,105] A prolonged dry spell for example, triggers high maximum temperatures, increasing the number of hot days.[106,107] Countries in the Global South are particularly vulnerable to these hazards, due in part to the absence of dedicated, evidence-based, affordable, and targeted policies needed to address the impacts of climate change.[108,109,110] Limited assets, resources, and weak adaptive capacities are other factors that make the Global South more vulnerable.

Global warming at 2ºC (over pre-industrial levels) will severely impact African food systems. For instance, there would be a production decline of about 50% in yield for sorghum. Also, insect-pest-driven losses may increase by up to 50% compared to 1950-2000.[111] Fodder availability is projected to decrease by 42% under climate change scenario RCP4.5 at 2ºC, leading to a projected decline in livestock net revenue of 8 to 32% under RCP4.5 at the same 2ºC. Global warming beyond 2ºC will place nearly all sub-Saharan African cropland substantially outside of its historical safe zone.[112] Furthermore, at 2°C, global warming will likely result in net losses for rice, maize, wheat, and soybean (even after accounting for potentially positive developments such as CO_2 fertilisation and genetic improvements).[111]

All aspects of food systems aimed at delivering sustainable, healthy diets (namely availability, accessibility, affordability, and desirability), have already been impacted by climate change in recent decades. Evidence suggests that a 1ºC temperature increase in developing countries triggers a three-percentage point reduction in agricultural output leading to a 1.3% decline in economic growth.[113] Looking to 2050, rising temperatures and rainfall volatility, are expected to lead to shrinkage of both available land and growing season, contributing to reduced productivity.

The impact of climate change is not limited to cereals, as elevated carbon dioxide decreases protein and micro-nutrient content in major food commodities (in the early days of climate research there was optimism that CO_2 enrichment might offset climate change). Some suggest that due to climatic change driving lower nutritional levels, an additional 175 million people may become deficient in zinc, a significant micronutrient for growth and immunity. An additional 122 million people are expected to become protein deficient, and another 1.4 billion women of child-bearing age and children under five years are predicted to lose more than 4% of dietary iron, worsening current deficiencies.[114,115,116]

Livestock production is already experiencing climate change impacts. For example, a number of sub-Saharan African countries have witnessed 20 to 60% loss in livestock numbers during severe drought in the past two or three decades. Both pasture quality and optimal animal physiology are affected by optimal temperatures beyond 30ºC with dairy yields projected to decrease by 10 to 25% under specific climate scenarios.[117]

Various combinations of impacts from climate variability will have significant socio-economic implications for agriculture, water availability, settlement and migration.[118] The livelihood of many rural dwellers experiencing absolute poverty are also expected to be adversely affected.[119,120] While the above statistics and projections are only illustrative of the impact of climate change scenarios, taken together they present a picture that should be deeply concerning for policy makers, particularly since all of these effects on food systems will coincide with greatly increased demands for food arising due from population increases (see Box 3.3).

Box 3.3: Threats to food systems threaten to disrupt the transformation of food systems

There is now wide international recognition of the need for food systems to be urgently transformed. The goal is to strive for universal access to diets that are healthy, safe and secure, affordable, and sustainably produced. Most countries made commitments to do so at the UN Food Systems Summit in 2021, and more recently at COP28 in 2023.

However, the growing threats to food systems reported in this chapter, together with inadequate resilience of those same systems, mean that efforts to implement transformation pathways risk being constantly derailed – as governments divert both economic and political resources to cope with short-term disruptions to food and nutrition as prices spike.

The key message here is that the implications of inadequate resilience of food systems go far beyond short term food supply. They threaten attaining the longer term dietary goal mentioned above – which in turn, is linked to delivery of a host of critically important policy goals on health and equity, child development, poverty and economic growth, climate change and sustainability.

PART II

The resilience of food systems in Sierra Leone, Malawi and Ethiopia

4 Strengthening resilience in Sierra Leone's food system

Feed Salone, Ministry of Agriculture and Food Security

Key messages

Box 4.1: Overview of work conducted in Sierra Leone

The goal of the work in Sierra Leone was to determine how the country's food system and the process of food system transformation can be made more resilient to a range of threats and shocks to help ensure access to sustainable, healthy diets for all. The country team held a series of meetings with food system experts, senior government officials, and civil society representatives, and carried out a review of the literature. It convened two major Stakeholder Workshops to review the threats to and weaknesses of food systems transformation in Sierra Leone, especially in the Government's flagship Feed Salone programme. The country's food system transformation pathways were also analysed to identify threats and vulnerabilities. The findings from these activities together with their implications are reported in this chapter.

Major national food security-related surveys have shown how the country's food and nutrition security situation is deteriorating. This is due to a cascade of challenges in recent years, together with exceptionally limited resources available to transform the country's food system to ensure that sustainable, healthy diets are available to all its citizens. Sierra Leone is one of the poorest countries in the world, with a GDP per capita of US$634.74 in 2023 and ranked 181 out of 191 countries in the Human Development Index (HDI).[121,122]

Actions since 2000 have had limited impact on the country's food system because of mismatched priorities for its pathways. However, the Feed Salone Program, based on the pledge of President Bio for his second five-year term in office, recognises the critical importance of the agricultural sector in the country's economy. It aims to reduce dependence on rice imports, encourage investment in other crops and reduce malnutrition and hunger. But further action is needed to deliver universal access to affordable and sustainable, healthy diets that are essential to the country's future, and to strengthen resilience in the face of worsening threats.

The work reported here demonstrates the opportunities, along with a clear vision for the policies and actions that need to be implemented. However, realising this vision requires concerted efforts by all actors working together: including government, the private sector, and development partners.

Substantial resources also need to be mobilised to enable these plans to be rolled out at scale. Feed Salone alone will cost US$1.6 billion to implement fully by 2028. The Government is expected to contribute substantially, but additional support is also needed from development partners, and by attracting private capital. Realising these additional resources remains a considerable challenge.

4.1 Introduction

Sierra Leone (Figure 4.1) is one of the poorest countries in the world, with a GDP per capita of US$634.74 in 2023[1] and ranked 181 out of 191 countries in the Human Development Index (HDI)[2]. Like many developing countries, Sierra Leone's economy is largely agrarian, with agriculture employing nearly 60% of the country's workforce and contributing about 60% of the country's GDP.[123] However, the country, like many other African nations, faces growing challenges to its food systems and its ability to provide sustainable, healthy diets for all. An increasingly volatile world is disrupting essential supply chains, which is a particular concern since 80% of foodstuffs consumed in Sierra Leone were imported in 2020. Persistent inflation, depreciation of the local currency, and a mounting African debt crisis further threaten to affect both the costs and availability of imports.

Figure 4.1: Map showing the physical geography of Sierra Leone

Source:GISGeography.com

The challenges and threats facing food systems transformation in Sierra Leone are many and interconnected. In particular population increase, climate change and economic challenges will have significant effects on the food systems. Therefore an analysis and understanding of these issues has revealed critical areas requiring focused interventions. Maintaining access to safe, nutritious and sufficient food for all in a sustainable manner is a critical concern to government and development partners, as the country's population increases. Specifically, increased population places additional stress on the country's food system. This situation is likely to be intensified by substantially increased food demand due to changes in the population and the economy. In particular an increase in food availability will be required to meet the demands of the growing population which is projected to rise from around 7.65 million today, to over 12.5 million by 2050 according to the UN Population Prospects.[124] As the population increases the need for diverse and nutritious food will rise to meet the health requirements of the growing population. This will also place substantial stress on the agricultural systems, especially land and resource use that will lead to soil degradation and deforestation resulting from clearing of more land for agriculture. As agriculture is dependent on rainfall, challenges to food and nutrition security could be amplified by unpredictable weather patterns, flooding and droughts. In the event economic growth fails to match with population increase, poverty will increase along with overdependence on food imports.

Following a nationwide food systems dialogue conducted in 2021 which included a wide range of national stakeholders, the country's food system was categorised as fragile with high levels of chronic 'food and nutrition insecurity', making the population highly vulnerable. This situation, which persists today, is attributable to several factors including periodic disruption of the food system by natural disasters such as flooding; pandemics including Ebola and COVID-19; outbreaks of plant and animal diseases and other pests; and challenging economic conditions mentioned above. These shocks with their ensuing disruptive outcomes have negatively impacted agricultural production, and diet quality, and undermined the livelihoods of vulnerable people across Sierra Leone.

According to the Comprehensive Food Security and Vulnerability Analysis (CFSVA), Sierra Leone's food insecurity increased by about 12% over ten years, from 45% in 2010, to 57% in 2020.[125] In 2021, with the outbreak of the COVID-19 pandemic while the country was slowly recovering from the Ebola Epidemic, 74% of the population was reported to be food insecure. This figure rose to 81% in August 2022. In 2024, 82% of the population were food insecure among which 18% of households were severely food insecure.[126]

Unsurprisingly, rising levels of food insecurity have been accompanied by declines in nutritional status. The Food Security Monitoring System Report (FSMS) 2023 report also showed further deterioration of household nutrition status in 2023 with the Global Acute malnutrition rates reaching 5% in February 2024.[126] These data clearly indicate widespread food insecurity and undernutrition, which have the potential to undermine the resilience of vulnerable households.

Alongside food insecurity, there is a growing issue of malnutrition associated with unhealthy diets in the country. Access to affordable, nutrient-dense foods is limited, and there is an increasing reliance on energy-dense, ultra-processed foods.[4] This shift is exacerbated by the absence of comprehensive policies or interventions to promote healthy eating and regulate the availability of unhealthy dietary options, contributing to the rising burden of diet-related diseases in the country.[127]

Much of the discussion about the nutritional status of the population in Sierra Leone has focused on food and nutrition security and malnutrition rather than on the affordability, and access to sustainable, healthy diets which is increasingly the conceptual framing applied by many organisations and policy makers around the world in dialogues on nutrition. The term 'nutrition security'* has been used extensively in policy documents in the country and is referred to accordingly in this chapter.

Local climate variability and the COVID-19 pandemic have also led to periodic disruption in the country's food system. At the national level, the economic activities of rural households were seriously hampered by disruptions to farming and other livelihood activities, which reduced household income levels and constrained purchasing power, limiting access to nutritious food items. These impacts have been exacerbated by inflation in the local markets, which averaged 15.5% from 2008 until 2024, reaching a record low of 13.6% in 2019 and an all-time high of 64.7% in 2023.[128] According to FSMS findings for February 2024, over 68% of households spent more than 75% of their expenditure on food.[126] Faced with reduced income levels, households have no option but to resort to coping strategies, making them less capable of recovering quickly and being resilient in the face of major crises.

Sierra Leone's food system is currently faced with diverse threats which are inhibiting the systematic development of processes to both build resilience and transform the food system (see Section 4.2). Several major threats are derived from the socioeconomic downturn in the country and environmental dynamics. According to the World Bank Country Overview Report, Sierra Leone's economy will continue to face significant challenges with high inflation, pressures on the currency, high risk of debt distress, and inadequate growth to support poverty reduction. In addition, despite efforts in 2023, further corrective fiscal and monetary measures are being put in place to address the high inflationary pressures and the worsened food security situation. Additionally, fluctuation in the rainfall pattern, degradation of forests due to climate effects and unscrupulous human activities, pest and disease outbreaks, and wildfires have adversely impacted the country's food system. The unfavourable economic outlook coupled with environmental issues further weakens the capability of food system actors to actively support food system activities in a scaled-up manner. Hence increased livelihood vulnerability and fragility of the food system becomes even more concerning.[129]

* 'Nutrition security' in the context of Sierra Leone, is taken to mean increased access to, and consumption of, diverse, safe and nutritious foods for sustainable reduction of malnutrition, especially for women and children.

The goal of this chapter is to explore how (a) to build a resilient food system in Sierra Leone to deliver universal access to sustainable, healthy diets and (b) how to ensure that the process of transforming the food system is resilient. In achieving this objective, the research involved input from a multi-disciplinary team of national and international experts, desk research, expert group meetings, and a two-day national workshop in Sierra Leone. Section 4.1 sets out current national initiatives which are relevant to building a more resilient food system in the country; Section 4.2 outlines the status of food system resilience while Section 4.3 explores the resilience of the food system transformation process.

4.1.1 Political support for a transformed food system in Sierra Leone

Strengthening resilience in food systems transformation in the context of Sierra Leone requires high political commitment and action. Therefore, recognising the importance of integrating resilience in key aspects of the economy, the Government of Sierra Leone established the Presidential Initiative on Climate Change, Renewable Energy and Food Security (PI-CREF) in 2024. PI-CREF has the mandate to support Ministries, Agencies, and Department (MDAs), in the implementation of programmes, policy coherence and resource mobilisation – for example in major programmes such as the Flagship Feed Salone agriculture and food security initiative 'Feed Salone' (PI-CREF 2024).[130]

In recognition of the critical role played by agriculture and food systems to national security, and socio-economic development, the Government launched the Feed Salone initiative which is designed to transform agriculture and food security to achieve 'food and nutrition security' in Sierra Leone. 'Feed Salone' is the flagship among the Government's 'Big 5' Game Changers, alongside Human Capital Development, Youth Employment, Technology and Infrastructure, and Transforming the Public Sector.

The Government's goal of attaining a more resilient and transformed food system was taken further at COP28 in 2023, when it became a founding member of the Alliance of Champions for Food System Transformation (ACF).[15] This coalition of ambitious countries aims to close the gaps between ambition and implementation throughout food systems. A 'whole of government' approach will be taken to drive systemic change; targeting positive changes across all five key outcomes: universal access to affordable, healthy and sustainable diets; equity and livelihoods; adaptation and resilience; mitigation, nature and biodiversity, and climate mitigation.

4.1.2 Feed Salone: Towards a more resilient and transformed food system

Food and nutrition security are high on the political agenda of Sierra Leone. This is reflected in the Medium-Term National Development Plan (MTNDP 2024-2030)[7] which identified agriculture, food security and nutrition as the top priority of the Government, and by the launch of Feed Salone initiative. This initiative has five objectives and four strategic pillars as stated below.

Objectives
- decrease food imports
- increase exports
- create jobs for women and youth
- alleviate hunger and malnutrition
- build resilient food systems.

Strategic pillars
- mechanisation and irrigation
- seed and input systems
- aggregation processing and marketing
- agricultural finance, agricultural technology and climate-smart agriculture, empowering women and youth.

Feed Salone, Ministry of Agriculture and Food Security

Various components of Feed Salone align with the 'five dimensions of resilience' framework used in this report (see Chapter 2).

Objective 1 is to reduce food imports, particularly rice, by 20% annually. This to be achieved through productivity increase, intensification and expansion of the area under cultivation. The first resilience dimension (pertaining to agro-ecological conditions) is relevant, through irrigation, mechanisation, improved seeds and input systems, agricultural technology and Climate Smart Agriculture.

Objective 2 is to boost export earnings, through optimising value chains such as cocoa, coffee, cashew and horticulture (fruits and pepper) targeting a 50% annual increase in exports. The second dimension of resilience (relating to the value chain) is applicable through export expansion, aggregation, processing and market linkages along with the establishment of agro-industrial clusters around rice bowls.

Objective 3 is to create at least 35,000 formal job opportunities by 2028, with the potential for thousands more in the informal sector. This will be achieved through establishment of agro-industrial zones dedicated to comprehensive production, processing, and marketing of critical value chains. They include rice, cocoa, coffee, cashew, small ruminants (sheep and goats), cassava products such as gari and flour, and fruits and vegetables. This objective contributes to the dimensions of resilience 3 and 4, set out in Chapter 2, as human capacity is developed, community-led activities promoted, jobs and wealth created and resilience built at consumer and household levels.

Through **Pillar 4 of Feed Salone** the Government is fostering private sector participation with increasing access to finance, investments in infrastructure and institutional strengthening to support resilience-building and food-systems transformation: this aligns with the fifth dimension of resilience (pertaining to institutional resilience).

4.1.3 Projects complementing the Feed Salone Initiative

The Feed Salone initiative is largely implemented through government and donor funded projects. There are four donor funded projects being implemented by the Ministry of Agriculture and Food Security (MAFS) which are contributing to building resilience and transforming food systems.

Food System Resilience Project in Sierra Leone (FSRP): is a World Bank funded initiative and is part of a Regional programme with the goal of increasing preparedness against food insecurity and improving resilience of the food system. With a budget of US$135 million, it has a five year implementation period and aims to benefit 943,000 people, of which 40% are women and 40% youth. Its goal is to improve agricultural and food crisis prevention and management using digital advisory services. Specifically, FSRP has three objectives:

(i) to improve agricultural and food crisis prevention and management using digital advisory services,

(ii) to expand food trade in West Africa and to facilitate trade of agricultural goods and inputs within and across national borders,

(iii) to meet the immediate food and nutrition needs of acutely food insecure agricultural households.

The Agricultural Value Chain Development Project (AVDP) is funded through a Loan and Grant Financing of US$97.3 million from IFAD, The OPEC Fund for International Development (OFID), the private sector, the Government of Sierra Leone and beneficiaries. The project started in 2019 for a six-year period with the goal of improving livelihoods, food security, and climate change resilience of rural farming households and increasing incomes for smallholder farmers through the promotion of agriculture as a business. The project is targeting an estimated 34,000 direct beneficiaries and their families, reaching a total of 204,000 people. AVDP has three mutually reinforcing components: (a) Climate Resilient and Smart Agricultural Production (b) Agricultural Market Development, to improve value chain organisation and performance and (c) Project Coordination and Management.

The Sierra Leone Rice Agro-Industrial Cluster (RAIC), is funded by the African Development Bank (AfDB) and being implemented in the rural floodplain areas of Pujehun and Bonthe Districts. The goal of the Rice Agro-Industrial Cluster Project (RAIC) is to contribute to rice self-sufficiency in Sierra Leone and improve the livelihoods of rural households. The specific objectives are to: (i) increase the productivity and production of rice by providing farmers access to quality inputs, land and water management, mechanisation and extension services; (ii) improve the value chain through the processing of high-quality rice; (iii) promoting the consumption and marketing of locally processed rice. The direct beneficiaries of the project are the estimated 35,000 active smallholder farmers and other Small and Medium Enterprise operators along the rice value chain in the area.

The Sierra Leone Agribusiness and Rice Value Chain Support Project (SLARiS) is designed to stimulate a viable upstream agribusiness sector in Sierra Leone. It is being implemented in the high potential agro-ecological zones in the country (specifically Kambia, Kenema and Moyamba) over a period of five (5) years (2019-2024). The goal of the project is to stimulate a viable upstream agribusiness sector to promote economic diversification, food security, sustainable employment opportunities and improved livelihoods. The specific project objective is to transform the agricultural input supply sub-sector as a viable and inclusive business opportunity, to promote enhanced production and productivity required to improve the livelihoods of beneficiaries along priority value chains (i.e. rice and maize). This project aims to promote economic diversification, food security, sustainable employment opportunities and improved livelihoods. The direct beneficiaries of the project are estimated to be 32,000 farmers in the high potential targeted regions. In addition, 1000 young agripreneurs and 4000 young graduates (disaggregated by age and gender) will benefit from the incubation programme and the new agribusiness training curriculum respectively. The project will create approximately 50,000 direct jobs and improve the lives of 150,000 indirect beneficiaries.

4.1.4 Attainment of food and nutrition security is a priority

Feed Salone and the four projects set out in Section 4.1.2 reflect the urgent priority accorded to food system transformation at the highest levels in the Government of Sierra Leone. They also highlight the strategic opportunity for the donor community to ensure a closer match between their support, and the country's widening ambitions and to build capacity to sustain implementation, so that its transformed food system can cope with the many exogenous threats anticipated in the decades ahead.[131] The country's focus on food system transformation is well justified. In common with many other African nations, the challenge of providing sustainable, healthy diets for all is set to greatly intensify as diverse threats combine to affect its food system. An increasingly volatile world has already seen the disruption of essential supply chains for food and agricultural inputs through the conflict in Ukraine. As noted earlier, in 2020, 80% of foodstuffs consumed in Sierra Leone were imported.[132] Persistent inflation and a mounting African debt crisis further threaten the supply of essential food imports. As the country seeks to substantially increase its domestic food production, those efforts will be challenged by intensifying climate change, and declining soil health, the latter being driven in part by land degradation and deforestation.[133]

Acting through the country's food system, these diverse crises are combining to threaten the goal of universal access to diets that are sustainable and healthy. These are essential for the development of the entire country, not just through preventing hunger and malnutrition, but also through the knock-on effects on the health and wellbeing of its population; on economic development through the livelihoods of 60% of the population involved in food production, and reduced productivity of its workforce; and the degradation of its natural environment through unsustainable agricultural practices.[12] Therefore, a strong and resilient food system is an essential foundation on which Sierra Leone's future rests.

However, providing food and nutrition security remains a very substantial challenge for the country. An estimated 82% of the population are food insecure, and an inflation rate currently around 47% has exacerbated the vulnerability of many citizens.[1,26] Although some progress has been made over the past 20 years in improving nutrition, particularly in breastfeeding (54% in 2021 compared with 3% in 2000), stunting (26% in 2021 compared with 45% in 2005) and wasting (6% down from 10% in the same period).[134] These past gains, hard won, face an uncertain future. 48% of women still suffer from anaemia and the mortality rate for children under five was 10.5% in 2021. Urgent actions are needed to address the persistent food insecurity.

4.1.5 Lessons from Feed Salone and required additions

Although implementation is at an early stage, Feed Salone has mobilised both national and international support, and has secured substantial financial commitments and goodwill from international financial institutions. Important lessons from this early progress include (a) ensuring the highest commitment from Government, with a Presidential Oversight Committee, supported by a technical committee, (b) adopting a selective approach to implementation (c) taking a 'whole of government' approach to implementation, and (d) securing effective donor and investment mobilisation involving the Ministry of Finance, the Ministry of Agriculture and Food Security, and the Presidential Initiative (PI-CREF).

4.2 Threat Assessment

Broadly, there are five categories of threats which have been identified in the project's expert workshops and consultations which could undermine resilience-building and transformation processes in Sierra Leone's food system. These are socioeconomic factors, food system activities, policy environment, production capacity and environmental drivers. It is important to note that these threats are likely to overlap along the food system segments. Table 4.1 below shows the most important threats across these categories†.

In addition, disruption in the food supply chains and distribution networks continue to pose a major threat to the food system in Sierra Leone. The main agri-food supply and distribution chains include both food imports and domestic food production along the value chain. While food imports have gained momentum over the past decades, the major share of households in the rural areas rely on the domestic food production and food supply chains for their survival. In contrast, most households in urban settings mainly rely on food imports. Unfavourable policy impacts on trade linkages between participating countries and increased tax levies are a source of major shocks to food importation in Sierra Leone, affecting food availability and reducing levels of access to food. This situation is further exacerbated by the country's difficulties in surmounting numerous food system challenges.

Climate change impacts in Sierra Leone continue to threaten food security and the livelihoods of the country's population. Changes in the rainfall pattern have incrementally affected the cropping calendar, increasing the risk of flooding on farmlands. According to reports from stakeholder interviews, this has led to major crop and livestock losses, worsening the problem of food availability and accessibility. With the indigenous farming knowledge of Sierra Leone crop and livestock producers, engendering understanding of the changing climate landscape has been a major challenge. Though the government and development partners have been supporting capacity building and other interventions, cascading of knowledge and support relating to climate change has been neither at sufficient scale nor adequate at the community level, creating a more complex environment for adaptive responses.

Recently, the Ministry of Agriculture and Food Security (MAFS) through the Feed Salone Strategy has directed major investments to support large-scale irrigation infrastructure to enhance multiple crop production in agro-ecologies with comparative advantages. This effort is bolstered by ongoing MAFS projects and interventions to include sustainable landscape management, agroforestry, reforestation, and value chain development, helping to manage agricultural risk arising from climate change and trade shocks.

Similarly, the introduction of climate-smart technologies is increasingly becoming a core competence in MAFS agenda. The provision of climate-resilient, certified improved seed varieties for rice, maize, cassava, orange fresh sweet potatoes; and improved livestock breeds by the Ministry in collaboration with donor partner projects and development partners is being scaled up to help build the agri-food system for the promotion of sustainable, healthy diets.

Donor support in value addition through investment in agri-food industries, appropriate investment in climate-smart agricultural research, improved food distribution linkages through improved feeder road networks, and the provision of productive energy sources among others, will contribute significantly to building and transforming the food system, to better manage current and future threats.

Table 4.1: The main threats to building resilience in Sierra Leone's food system

Category	Main threats
Socio-economic factors	(a) High expenditure on food at the household level; (b) Weak social capital to enhance community group response to shocks; (c) High poverty headcount; debt crisis; and (d) Inflation.
Food system activities	(a) High prices of production inputs; (b) Limited availability and high cost of labour for farming (c) Crop failure; (d) High livestock mortality rate; (e) Population changes; and (f) Theft.
Policy Environment	(a) Absence of robust food environment policies; (b) Weak enforcement of local policy; (c) Absence of crop and livestock insurance schemes; (d) No unified concessional agricultural loans; (e) Buyer/consumer price setting for agricultural produce; (f) High tariffs/taxation; and (g) Regional trade barriers.
Production capacity	(a) Low private-sector investment; (b) High cost of production inputs; (c) Limited availability of affordable farm machines; (d) Limited availability and high cost of labour for farming; (e) Private sector overdependence on government support; (f) Limited availability of productive inputs.
Climate change and other environmental drivers	(a) Erratic rainfall pattern; (b) Deforestation; (c) Land degradation; Pest and disease outbreaks

Source: Stakeholders' consultations, Sierra Leone 2024

†Identified through stakeholder consultations and national workshop on 12 September 2024.

4.3 The state of resilience of Sierra Leone's Food Systems today

This section discusses the resilience of the country's food system, within the context of the threats set out above in Section 4.2. The discussion is framed around the 'five dimensions of resilience' framework as set out in Chapter 2. This breaks the assessment down into five themes: (i) production resilience, (ii) agri-food value chain resilience, (iii) consumer/household resilience, (iv) community resilience, and (v) institutional resilience.

4.3.1 Agro-ecosystem resilience

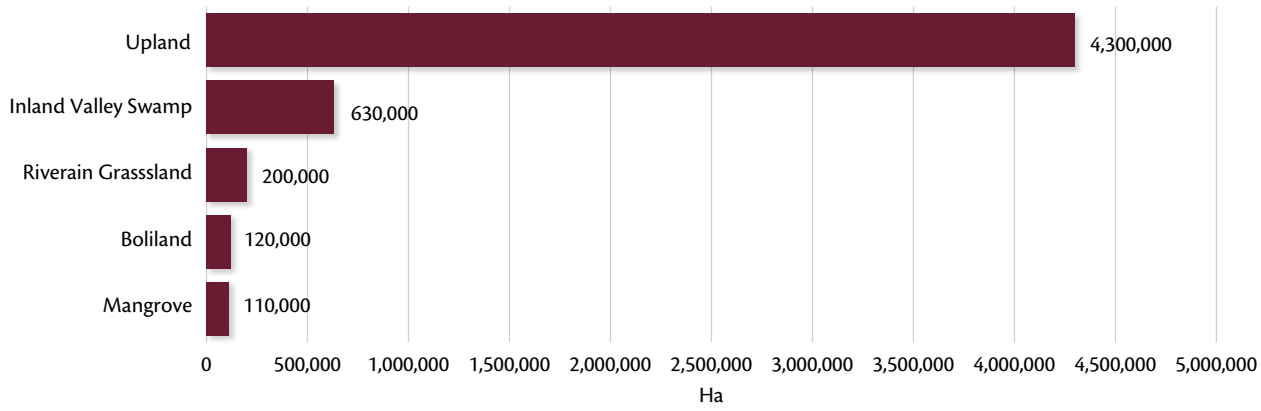
Sierra Leone is endowed with abundant natural resources which support agricultural production. With distinct comparative advantages, the country has ample arable land suitable for sustainable crops and livestock production. The five major agro-ecologies in Sierra Leone and the arable land within them are shown in Figure 4.2.

The agro-ecologies include Upland, Boliland, Inland Valley Swamps, Riverine, and Mangrove which together make up about 5.14 million hectares (12.85 million acres) of arable land in different areas of the country. They also divide the country into food economy zones based on comparative advantages. The northern part of the country is mainly characterised by livestock and rice food economic zones due to the vast upland with grassland features, boli land, and mangrove ecologies. The southern part comprises rice and tree crops which are suited to the vast riverine with flood plains and inland valley swamps. The eastern region, which has very extensive uplands with tropical rainforest and inland valley swamps, is predominantly used for cash crops and mining. Lastly, the western part of the country, which has a coastal environment and inland valley swamps with some mangroves, is used for vegetables and fishing. This agro-ecological distinction across the regions in Sierra Leone determines the livelihood patterns of farming households, having direct bearing on the seventeen agreed food system pathways of the country.[135]

Feed Salone, Ministry of Agriculture and Food Security

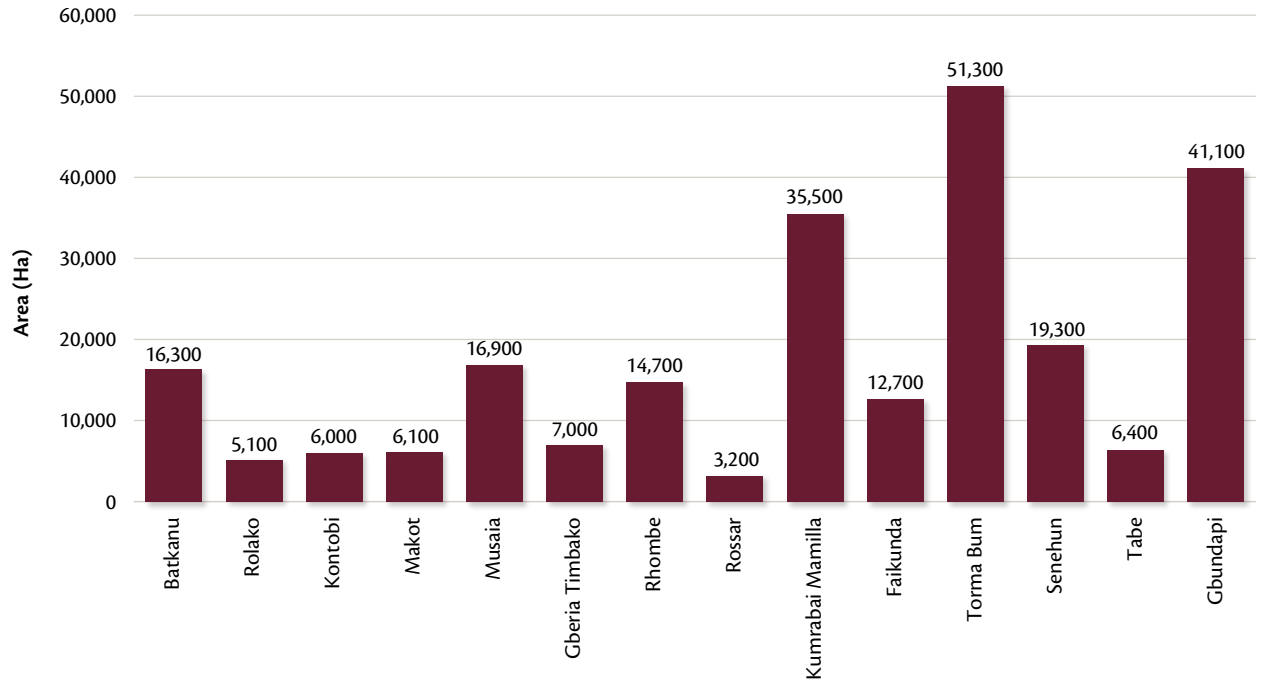
In addition to the rich endowment of arable land cover, Sierra Leone has major watersheds with nine large rivers in almost every part of the country including the Great Scarcies, Little Scarcies, River Rokel, Moa River, Mano River, Sewa River, Jong River, Waange River, and Taia River.[136] This, coupled with the abundant rainfall (between 2,000 and 4,000 mm per annum), presents very substantial opportunities for large-scale irrigation with sustainable water management technologies that help boost production and productivity (see Figure 4.3). The country also has about 2.75 million hectares of dense rainforest cover along the southeastern belt and in the region of the Liberian border, offering major opportunities for ecotourism and biodiversity conservation practices, which help to protect the topsoil layers and bolster the water retention capacity of the soil along crop production corridors.[137]

Figure 4.2: Arable land in each agro-ecology in hectares



Source: Land Resources Survey Project, Ministry of Agriculture and Natural Resources, Government of Sierra Leone

Figure 4.3: Irrigation potential in some rice producing areas



Source: National Irrigation System Development, Ministry of Agriculture and Forestry, Government of Sierra Leone

Despite the abundance of arable land cover and abundant water sources, irrigation development is in place in less than 1% of the available arable land, which is mainly used for small-scale farming. Crop production nationwide has therefore remained largely rudimentary and rain-fed, with hardly any multiple cropping systems per annum. Nonetheless, the huge potential of land and water resources could be harnessed to establish large-scale irrigation systems that would enhance production and productivity of major food crops, including rice and vegetables for healthy diets, with integrated farming possibilities such as cropping and aquaculture.

Since the year 2000, several agro-ecological and climatic factors have led to changes in the zonation of the agri-food economy. Between 2000-2010, the country's forest cover was reduced by 125 km^2 (0.17%), with a corresponding increase in shrubs, grassland, and sparsely vegetated areas situated predominantly in savannah woodlands and the coastal plains agro-climatic zones, which showed a 0.9% increase, from 16.01% in 2000 to 16.10% in 2010.[138] In major forest communities, there has been notable increase in croplands due to traditional slash-and-burn shifting cultivation practices. According to a report by USAID, Sierra Leone has lost about 30% of its forest cover between 1975 and 2013 with an annual average loss of 0.8%, mainly due to unsustainable land use practices.

Consequently, the productivity level of agricultural land over a ten-year period (2000-2010) shows a declining trend for 0.0048% (352.8 km^2) of the total land surface while 0.029% (2,161.26 km^2) show a trend of early signs of decline. In terms of ecosystem resilience, 0.13% (9722.7 km^2) of the land surface show a stable but stressed trend and 0.50% of the land surface (36,865.98 km^2) shows a stable not stressed trend, while 0.30% of the land surface (22,530.6 km^2) shows a trend of increasing productivity.

Implementation of the Pillar 1 of Feed Salone aims to address these losses through activities that improve land and soil fertility, as current farming practices are unsustainable and continuing to lead to depletion of land and soil fertility. Sustainable agricultural practices that have been introduced to farmers include tree planting on degraded lands, and planting of trees of economic value on the fringes of developed swamps; agro-forestry along production corridors; and use of organic manure for mulching, and animal manure as fertiliser. However, these practices have not been done at scale. Nonetheless, the Food System Resilience Program (FSRP) supports interventions to strengthen the productive base of agriculture, with diverse climate-smart and soil health restoration practices. Similarly, the Agriculture Value Chain Development Project (AVDP) implements climate-smart agriculture model farms for soil conservation and resilience building to mitigate climate shocks.

4.3.2 Agri-food value chain resilience

Food consumption forms a major part of household spending in Sierra Leone. While this is the case, local food production has not been fully up to scale to address the national food consumption requirement for rice. This makes the country a net importer of food. About 70% of household income is spent on food with a major part of this spent on rice alone. Similarly to some other West African countries, rice is the major staple of Sierra Leone, consumed by nearly all households – about 96% of all households (2014) with a per capita consumption of 131 kg.[139] The resilience of the agri-food value chain is thus analysed using data on rice production and imports. Over the past ten years (2014 to 2023), domestic rice production averaged 730,084 tonnes of milled rice equivalent. During this period the highest production occurred in 2016 with 963,874 tonnes of milled rice equivalent, while the lowest was in 2014 at 489,902 tonnes of milled rice equivalent. Within this same period, rice imports averaged 352,968 tonnes with the highest in 2015 at 640,688 tonnes and the lowest in 2023 at 207,727 tonnes.

4.3.3 Consumer / Household resilience

The population in Sierra Leone is diverse with two main divisions based on varied socioeconomic dimensions i.e. rural and urban populations. These divisions are faced with different socioeconomic challenges, determining how sustainable their livelihoods are and their capacity for resilience. According to the 2020 Comprehensive Food Security and Vulnerability (CFSVA) report (2020), the rural populations are considered the most vulnerable – about 57% were food insecure in that year.[125] Their livelihood portfolio is less diverse, relying mainly on agriculture. Over 75% of their total income is spent mainly on food, giving them limited capacity to invest in large-scale farming. The average land holding size per rural household for farming is less than an acre which is a reflection of the labour intensiveness of farming amongst the rural population. In fact, dynamism in socioeconomic opportunities has forced some of the rural labour force to move into urban communities, further shrinking the labour pool for farming in the rural areas.

Other categories of vulnerable populations include slum dwellers and people living in peri-urban communities. The majority of these people are from the rural communities, having limited social and financial capital to face urban livelihood challenges, making them prone to socioeconomic shocks, with limited opportunities to engage in food system activities for resilience.

Amid the recent global scourges and their related negative effects, these categories of population have been further challenged, affecting their level of access to nutritious food, given the rising food prices resulting from disruption of the food supply chain coupled with unfavourable changes in the macro-economic factors of the country.

Given this challenging socioeconomic context, households have been heavily constrained with food problems over the past ten years, having poor food consumption patterns with less diverse dietary intakes. According to the CFSVA, as noted earlier, in 2010, the situation presented at 45%, increasing to 57% in 2020.[125] Also, according to the Food System Monitoring Report (WFP, 2023), this figure jumped to 80% in September 2023. It is therefore

evident that households are less resilient, hence prone to food crises leading to deteriorating food security status.

4.3.4 Community resilience

Over the past ten years, it has been observed that most communities nationwide have a weak capacity: to prepare for anticipated food crises; to adapt to changing conditions; and to recover quickly from shocks affecting their livelihoods. This situation is largely attributed to the following factors:

- Poor road networks linking production localities to market locations.
- Poor extension services limiting agricultural technology transfer and adoption rate.
- Weak community-based organisations to support vulnerable households and farmers.
- Limited resources to support community level investments in agricultural infrastructure.

However, much effort has been made by the Ministry of Agriculture and Food Security in collaboration with development partners to enhance the capacity of communities to respond collectively to emerging food crises and other livelihood threatening disasters. Amongst these are the establishment of over 130 Agricultural Business Centers (ABCs) across the country to drive local production efforts and support value chain development, 675 Farmer Based Organizations (FBOs) to support production intensification, and an umbrella National Federation of Farmers (NaFFSL) to advocate for farmers and support capacity building.

To further strengthen the production environment for communities, the government has reinforced private sector involvement through major production schemes including the Agro-Dealership arrangement for the distribution of farm inputs to communities and the establishment of 15 government-led Machine Ring facilities to improve access to farm machinery services. In addition, FSRP, RAIC, and other ongoing MAFS projects are taking investments to communities for resilience building. These supports are expected to increase preparedness of communities in responding to food crises and looming disasters. However, it must be noted that the MAFS programmes have not integrated nutrition and nutrition sensitive agriculture well into the production environment.

4.3.5 Institutional resilience

Transformation of the food system in Sierra Leone is a national call spearheaded by the Ministry of Agriculture and Food Security, and supported by development partners. The drive to focus on key areas has been critical in the government's effort to establish a sustainable food system in the country. Over two decades ago, the government instituted support activities that aim at coordinating disaster responses during emergencies in collaboration with Non-Governmental Organisations (NGOs) and development partners. The Office of National Security (ONS) was empowered to deal with disaster issues both in the context of food crises and national security through the coordination of six disaster management platforms including: Food and Nutrition Security Early Warning, Epidemics, Fire, Migration, Flooding, Earth Movement.

At the sectoral level, the Ministry of Agriculture and Food Security has the mandate to design and implement agricultural programmes across the country while coordinating the efforts of all development partners in the agriculture sector. MAFS is well established in the country with structures at both national and district level. In addition, given the multi-faceted nature of the food system, there are other key institutions that implement segments of the food system activities in the country and support responses to major crises. Table 4.2 below lists these institutions and their capacity to respond.

As successful as these institutions have been in responding to such situations over the past decade, they have been faced with challenges that limit their performance. These include: inadequate human capital, limited financial resources due to tight fiscal limits, weak infrastructure and productive capital, ineffective cross-sectoral engagement for unified actions, poor monitoring mechanisms, inefficiency in managing donor funded programmes, disharmony in national food system actions, poor availability of quality data, and policy incoherence with government priorities. Over the past decades, safety nets programmes in response to major crises have been a multi-stakeholder concern. Government institutions including the National Commission for Social Action (NaCSA), the Ministry of Social Welfare, the Ministry of Health, and the Ministry of Agriculture and Food Security, have directed tremendous efforts to support safety nets.

Table 4.2: Institutions and their capacity to respond

Institutions	Capacity to Respond to Major Crises
Ministry of Agriculture and Food Security	Government and donor support such as the Food System Resilience Program
National Disaster Management Agency	Mobilises resources and coordinates major crisis response
National Commission for Social Action	Capacity to mobilise resources and coordinate social safety net programme
Development Partners WFP, FAO, World Bank	Provide funds through crisis response windows to support short-term emergency programmes

Source: Authors

Feed Salone, Ministry of Agriculture and Food Security

At the multi-national level, the World Food Programme (WFP), the Food and Agriculture Organization (FAO), the UN International Children Emergency Fund (UNICEF), and the International Fund for Agricultural Development (IFAD), have immensely supported the government to fund programmes including cash for work, unconditional cash transfers, augmentation of local production for food availability, food aid programmes, and nutrition specific and nutrition sensitive interventions. Though these programmes have been very instrumental in household recovery from major crises, their scope has been inadequate to address the diverse livelihood needs. It is important for these programmes to be scaled up in a more strategic way, and integrated into the food system pathway of the country.

Since 2022, Sierra Leone has formed part of the global network to develop and implement the country-specific UN Food System pathways – agreed actions were to be implemented by countries to strengthen their respective food systems. Generally, Sierra Leone has been on course in the implementation with high level political commitments. In terms of progress, the Government has been coordinating food systems activities since the launch of the National Food Systems synthesis and National Pathways report in 2023 during the World Food Day celebration in Kono District. Some of the notable achievements include: the design of a multi-stakeholder approach in collaboration with FAO and the EU to implement the transformation of identified food system pathway recommendations, participation in the both regional and global food system stock taking in 2022 and 2023 respectively, and the creation of five thematic groups including Food and Nutrition Security and Health, Agro-ecological, Agri-food Value chain, Marine Fisheries and Aquaculture, and Institutional Architecture. However, effective coordination of food systems activities of both development partners and national stakeholders has remained weak, leading to several uncoordinated projects and activities.

Furthermore, the Government is at an advanced stage with establishing a Food System Unit under the ambit of the Presidency to coordinate multi-sectoral/multi-stakeholder processes required to build resilience and transform the food system in Sierra Leone. In addition, the recent policy shift by the Government to prioritise agriculture as a flagship programme saw the emergence of the Feed Salone program and the establishment of the Presidential Initiative on Food Security, Climate Change, and Renewable Energy as the call for action to enhance the successful implementation of UN Food System Pathways in the country. Recently, a SUN (The Scaling Up Nutrition Secretariat) and Food Systems Coordination Unit has been established under the Minister of State in the Office of the Vice President. However, there are existing structures and processes which offer excellent opportunities to promote the implementation of the UN Food System Pathways for Sierra Leone. In this vein, existing national structures supporting resilience-building and transformation processes can leverage current efforts to scale up the implementation processes.

Suggested relevant structures include:

- The Food Security Working Group is hosted jointly by the Ministry of Agriculture and Food Security and FAO. This working group comprises food and nutrition experts who meet monthly.
- The Scaling Up Nutrition Secretariat (SUN) in the Office of the Vice President. Multi-sectoral coordination and advocacy on food and nutrition security.
- The Agriculture Advisory Group (AAG), which is chaired by the Minister of Agriculture and Food Security, involves all Development Partners operating in the sector.

The PI-CREF, Office of the President is providing support to strengthen capacity of Food Systems coordinating structures, facilitating partnerships and catalysing resource mobilisation efforts.

4.4 Evaluating the resilience of food system transformation

Sierra Leone's Food System is currently faced with diverse threats inhibiting smooth progression of processes to build resilience and transform the food system. Major threats arise from the socioeconomic downturn in the country and negative environmental dynamics. The binding constraints to food systems resilience building and transformation are highlighted in the next section.

4.4.1 Binding constraints to resilience of food systems transformation

Weak macroeconomic performance hindering resilience of food systems transformation. The weak performance of the country's economy continues to be a threat to the attainment of a sustainable food system. From the *World Bank Country Overview Report*, Sierra Leone's economy continues to face significant challenges with high inflation, pressures on the currency, high risk of debt distress, and inadequate growth to support poverty reduction.[129] The report further states that despite some efforts in 2023, further corrective fiscal and monetary measures are urgently needed to address the high inflationary pressures and the worsened food security situation.

Fluctuations in rainfall patterns and degradation of land and forests. Fluctuation in the rainfall pattern, degradation of forests due to climate effects and unscrupulous human activities, pest and disease outbreaks, and wildfires, have shown negative impacts on the country's food system. The unfavourable economic outlook coupled with these environmental issues further weakens the capability of food system actors to actively support food system activities in a scaled-up manner. The outcome is increased livelihood vulnerability and fragility of the food system.

4.5 Actions to catalyse food system transformation and strengthen its resilience

4.5.1 Key measures

Sierra Leone's vision in building and transforming sustainable food systems to deliver healthy diets for all requires concerted efforts by all actors including government, the private sector, and development partners. Coordination across all parties and the programmes they are involved in, is critically important to ensure a coherent approach, and to prevent duplication and actions cutting across each other.

Over the past two and half decades (2000 to 2024), several food system-related programmes have been planned and implemented but with low impact on the overall food system because of mismatched priorities relating to the food system pathways. However, the Feed Salone Programme offers a well-integrated visionary approach that addresses *a major part* of the identified food system pathway requirements but not all. As articulated in the Feed Salone concept, the desired objectives are directed to attaining food self-sufficiency, building resilience in the country's food system, and boosting inclusive economic growth. These objectives in themselves demonstrate a formidable approach to actualising a sustainable food system in the country. However, the implications of a deeper ambition towards the establishment of a sustainable food system in totality is as yet unclear. However, it is envisioned that to establish a more reinforcing, robust, and sustainable food system that goes beyond feeding people and assuaging hunger to provide healthy, affordable and available diets for all will require *inter alia* the key measures (set out in Box 4.2). These should be integral to whatever interventions are planned.

Box 4.2: Key measures needed to strengthen the resilience of Sierra Leone's food system

1. Strengthening multi-level governance of food systems: There are several ongoing programmes and activities funded by government and development partners aimed at building resilience and transforming the food systems. Better coordination at various levels and among development partners will improve the quality of results and effectiveness of impacts of food systems investments. Allocating resources for building and strengthening multi-level coordination, data collection, management and dissemination as well as support for cross-sectoral planning and programming is required. Additional efforts to strengthen food systems governance should include provision of support for multi-level data collection, management and dissemination. Resources should also be allocated for building capacity in food systems strategy especially among key food systems stakeholders.

2. Strengthening resilience to multiple shocks: Sierra Leone's food system remains highly fragile due to its vulnerability to a range of shocks, including economic downturns, environmental changes, and natural disasters. A comprehensive resilience-building strategy must be developed to safeguard against these risks, with particular attention to the impacts of climate change, enhancing self-food sufficiency, reducing poverty, conflicts, and economic crises. This should also include strengthening disaster preparedness and response systems to reduce food system disruptions.

3. Closing the nutrition security/nutrition resilience gap: Ensuring nutrition security and resilience is essential to overcoming malnutrition and promoting sustainable, healthy diets. Policies and programmes should focus on improving access to diverse, nutrient-dense foods while reducing reliance on energy-dense, ultra-processed alternatives. Strengthening nutrition-sensitive agricultural practices, such as growing more fruits and vegetables, including pulses and promoting biofortified crops, is critical to fostering long-term health and economic productivity.

4. Scaling up climate-smart agriculture: Low adoption of climate-smart agricultural practices is hampering resilience efforts. Expanding the use of climate-resilient seeds, agroforestry, water management techniques, climate resilient farm machinery and equipment and soil health restoration practices can help mitigate climate risks and enhance access to healthy diets. Investment in climate-smart technologies should be scaled up to ensure long-term sustainability in agricultural production. Increased support and fiscal incentives are needed to promote sustainable intensification of food crops and livestock, to improve labour, energy and water saving production and post-production machinery and digital technologies.

5. Strengthening supply chains and distribution networks: Sierra Leone's food supply chains are vulnerable to shocks, impacting food availability and access. Strengthening local production and distribution networks, improving market access, and reducing post-harvest losses are critical to improving food security and access to sustainable, healthy diets for all. Investments in transport infrastructure, cold storage, and value chains will help ensure nutritious food reaches consumers more efficiently and affordably.

6. Promoting ethical private sector investment in food systems transformation: The private sector must play a more significant role in driving sustainable food system transformation and in strengthening the resilience of food systems. However, such investments must be ethical, transformative and inclusive (small-, medium and large scale). Support from development partners and the Government is required to ensure adequate safeguards are in place, and barriers to private sector investments are removed. Targeted support at scale is required to encourage private investment in agricultural value chains, climate-smart agriculture, and food systems infrastructure. Clear incentives and regulatory frameworks should be established to encourage private sector participation that aligns with public health and environmental goals.

7. Increasing investment in agro-food industrialisation to reduce food waste and loss: Agro-food industrialisation is a pull factor in food systems transformation. It will link farmers to markets, attract private sector investments along the food supply value chain, and lead to food waste and loss reduction. The reduction of food waste and loss can contribute to the increased availability and security of foods, particularly fruits and vegetables, livestock and livestock products that tend to spoil, causing economic losses to farmers. Building resilience and ensuring food security therefore requires increased support for the establishment of agro-food processing clusters or parks, improving access to primary infrastructure such as roads, clean energy, and water.

Feed Salone, Ministry of Agriculture and Food Security

4.5.2 Short, medium and long-term actions

The following broad actions to be taken to strengthen resilience in the transformation of food systems in Sierra Leone, can be categorised into short, medium, and long term:

Short-term (1-4 years)

- Strengthen institutional coordination (for donors and national actors)
- Build institutional and human capacity for resilience building
- Address gaps in the provision of sustainable, affordable and available healthy diets
- Address the limited access to resources and technology for rural and peri-urban populations
- Promote climate-smart agricultural and environmental management practices
- Promote sustainable agricultural mechanisation along and across value chains
- Engage the private sector to mobilise investments in resilience building activities
- Promote private sector-led commercial agricultural investment
- Establish public procurement of sustainable, healthy diets in schools, hospitals and other public institutions

Medium-term (5-9 years)

- Catalyse agro-industrialisation and trade through integrated agro-industrial clusters
- Promote profitable value chains development, food supply chains and distribution networks
- Develop actions to build resilience of food systems to climate change
- Address the fragility of food systems to multiple shocks (economic, environmental, man-made disasters including conflicts, natural disasters).
- Support community/local led-food systems transformation and resilient actions
- Provide sustainable energy to support agriculture, agro-industry and value addition
- Establish a modern food reserve system with specialised storage facilities

Long-term (10 years +)

- Create enabling environments and facilitating demand-driven actions from consumers
- Intensify and diversify agricultural production based on comparative advantages
- Modernise agricultural and food systems activities
- Integrate the provision of sustainable, healthy diets for all with climate change mitigation and adaptation
- Promote income diversification, and consumption of diversified, sustainable, healthy diets

5 Strengthening resilience in Malawi's food system

Key messages

Box 5.1: Overview of the work conducted in Malawi

The goal of the project in Malawi was to explore a) how to strengthen the resilience of the country's food system and b) how to make the process of food system transformation itself resilient. Malawi's vision is to become an inclusively wealthy and self-reliant nation by 2063 – food production and its distribution processes specifically align with this goal. A starting point for the work was an expert workshop to review terms of reference for technical work, and to analyse the resilience of Malawi's food systems and their transformation, and the associated processes. The work also drew substantially on a Stakeholder Workshop held in July 2024. This provided important input for a synthesis of resilience of Malawi's food systems transformation – undertaken by experts in key topic areas. Local experts oversaw all of this work, and compiled a country report in association with other Global Panel experts. This chapter outlines the findings of the work.

Malawi is faced with multiple challenges that severely constrain its progress towards achieving its strategic goal to become a lower middle-income economy, and to meet most of the Sustainable Development Goals (SDGs) by 2030. Food systems transformation is considered vitally important to delivering these strategic goals. In this context, examining resilience of the transformation process itself is a priority, given the many challenges the country faces.

Food and nutrition security is a major issue for the country. National crop production estimates were recorded at their lowest in 2023/24 by 29% with widespread food and nutrition insecurity affecting close to four million of the population. Persistent hunger threatens stability and security, especially since 2025 is a presidential election year.

Climate change is viewed as a priority threat to Malawi's food system transformation, impacting food production in multiple ways. 80% of farmers are smallholders who depend on the rains in a single growing season. Population growth adds further pressure on the food system owing to a mismatch between the trends in population dynamics, and food production and availability.

Food systems transformation initiatives are heavily affected by macroeconomic instability characterised by low economic growth, high inflation, and devaluation of the Kwacha. Smallholder farmers are especially vulnerable; moreover, sustainable agricultural practices are not a priority for them – this risks building up environmental problems for the future.

The Government is already building resilience into agricultural production, but considerably more needs to be done. This project has identified priorities for the short-, medium- and long-term, linked to existing flagship programmes. However, very substantial investments are needed to deliver sustainable development and bring about transformative change.

5.1 Introduction

The transformation agenda of Malawi's food system is closely linked to Malawi's vision *Malawi 2063* (see Figure 5.1). The latter aims to create an inclusively wealthy and self-reliant nation.[143] This vision is operationalised in 10-year phases, the first of which seeks for the country to become lower middle-income, and second; for most of the Sustainable Development Goals (SDGs) to be met, including ending hunger, ensuring food security and improving nutrition by 2030.[140] These goals align with Malawi's Food System Transformation Initiatives (FSTI), which conversely, is seen as a catalyst to achieving Malawi's 2063 vision.

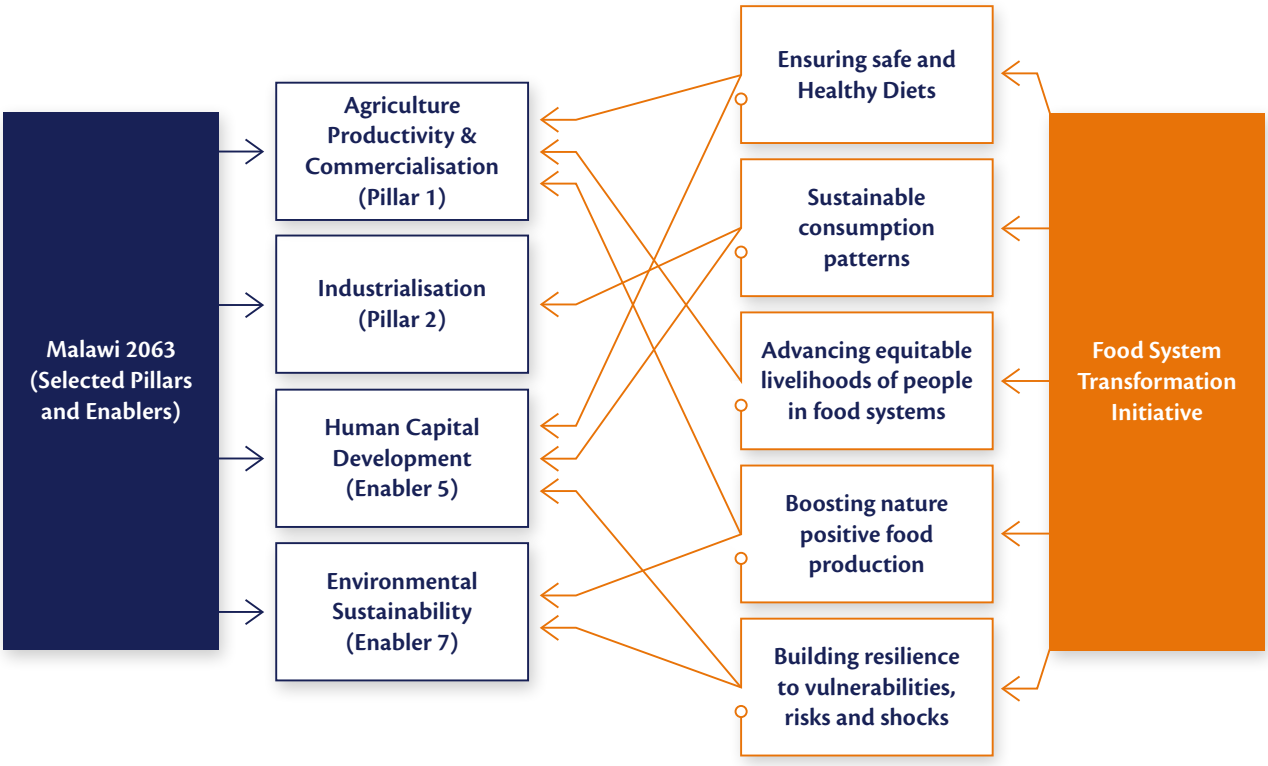
Malawi's FSTI has 5 Action Tracks (see Figure 5.1): 1) ensuring safe and nutritious foods for all, 2) shifting to sustainable consumption patterns, 3) boosting nature positive food production, 4) advancing equitable livelihoods of people involved in food systems and, 5) building resilience to vulnerabilities, shocks and stresses.[141] Each of these contribute to efforts to deliver Malawi's transformation. Both Malawi 2063 and FSTI are taking place in the context of population growth, climate change and variability, environmental degradation and potential social conflicts – all of which are likely to compound efforts towards achieving environmentally sustainable and resilient food systems transformation.

Building food-systems transformation processes that are resilient and sustainable, is key to ensuring food and nutrition security for all, without compromising the capacity of future generations to achieve the same. It is also needed in the drive to deliver economic, social and environmental goals and outcomes. A resilient food system needs to anticipate, absorb and recover from shocks quickly, efficiently and sustainably.[142] This demands that various elements of food systems interact more effectively from production to consumption. It also requires the public and private sector, academia, development partners and civil society organisations to be involved and working together in concert.

The Food Systems Transformation Initiative links to Malawi's long-term development plan (Malawi 2063) through various pillars and enablers of the Malawi 2063 vision – as set out in Figure 5.1. For instance, the food production action track of the FSTI aligns with pillar 1 of the vision – Agriculture productivity and commercialisation – which seeks to achieve an optimally productive and commercialised agriculture sector. Here areas of focus include enhancing productivity and diversifying crops and livestock, with the goal of greater commercialisation and food self-sufficiency.

The FSTI action track concerning sustainable consumption patterns aligns with Malawi 2063 pillar 2 – Industrialisation – focusing on agro processing for adding value. The aim here is to raise the nutritional content of food while increasing incomes and wealth. Also, the FSTI action track addressing nutrition patterns and diets is consistent with enabler 5; Human Capital Development. This in turn, has key focus areas: Population, Health and Nutrition. Here the target is to engender a population that is healthy and competitive, with fit-for-purpose

Figure 5.1: Interconnections / Alignment of Food Systems Transformation to Malawi 2063



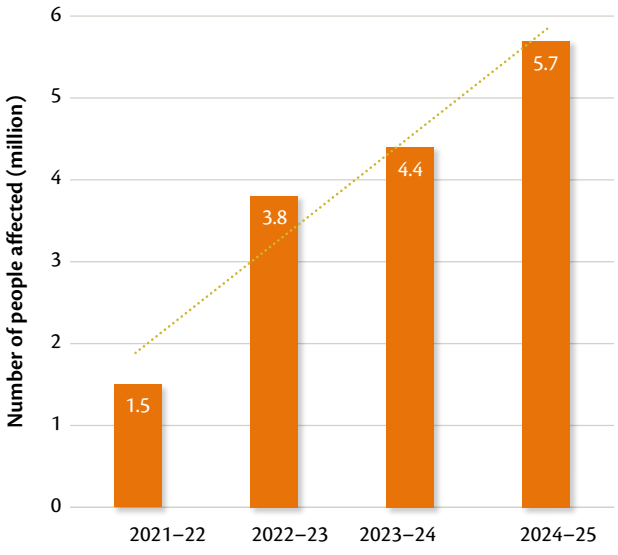
Source: Authors

skills. Further efforts are geared towards improving the resilience of poor, marginalised and vulnerable groups, by stimulating their ability to prepare for, cope with and adapt to shocks.

Malawi is faced with significant challenges that constrain its progress towards achieving strategic milestones within the Malawi 2063 vision: notably graduating to become a lower middle-income economy and meeting most of the SDGs by 2030.[143] Achieving these in the required timescales has been heavily compromised by the struggle to bounce back onto a trajectory of growth following COVID-19 which reduced its annual Gross Domestic Product (GDP) growth below 2%.[144] Distant conflicts like the Russia-Ukraine have disrupted supply chains for agricultural commodities such as fertilisers, pesticides and other farm implements, plunging smallholder farmers and the nation into a lower-than-average level of food production. This has led to a rise in food insecurity and malnutrition by 20%and 35% respectively. [6,145] Persistent episodes of health pandemics (i.e. COVID-19, cholera and the red-eye disease and M-Pox) increase health and social care costs, straining an already thin government fiscal resource space. Substantial increases in debt (up to 80% of GDP), high inflation of 33.9%) and a foreign exchange squeeze, have combined to push the cost of living higher, resulting in increasing hunger and have substantially compromised the quality of life for the population.[145,146] Figure 5.2 shows a 4-year trend of food insecurity in the Malawian population.

Indeed, Malawi's population is projected to grow from 20.3 million in 2024 to an estimated 33.6 million in 2050.[147] This suggests that increasing population pressure will have significant implications on the country's food and nutrition security situation now and in the future. Malawi's food and nutrition security situation also remains precarious because of persistent climatic shocks such as floods and droughts with 13 El Niño and 5 La Niña episodes since 1980, punctuated by adverse food production and hydrological conditions that have paralysed household's capacities for better livelihoods.

Figure 5.2: Trends in acute food insecurity in Malawi (lean period: October – March)



Source: Integrated Food Security Phase Classification Reports, 2020-24

Despite these setbacks, the Government of Malawi has been decisive about transforming its food systems. The President directed the Minister of Agriculture to convene national and district level dialogues with stakeholders, aimed at identifying key challenges in line with the United Nations Food Systems Summit (UNFSS) of 2021. These dialogues led to a synthesis report which identified action tracks for addressing five major challenges for Malawi's food systems transformation process, and also led to the overarching Food Systems Transformation Initiative. The momentum gained around the UNFSS confirmed the need for a more system-based approach involving all stakeholders – including government, development partners, and the private sector.

5.2 Evaluating Malawi's flagship programmes for resilient food systems transformation

The Government has instigated several flagship programs relating to resilient food systems transformation. The following provides brief background information on some initiatives and lessons learned from implementation.

The Shire Valley Transformation Program (SVTP)

SVTP (2018-2032) aims at improving livelihoods by transforming agricultural systems from predominantly rain-fed, to become sustainable, irrigated and resilient. The programme involves construction of a modern large-scale irrigation system drawing water from the Shire River in the districts of Chikwawa and Nsanje to irrigate 43,370 hectares of land. This will replace traditional small-scale irrigation patches that were used by farmers, to improve water access during droughts for high-value crop cultivation. Additionally, the programme supports catchment conservation, land tenure security and the organisation of farmers into productive cooperatives.

The systematic and integrative nature of the project holds promise for transforming agriculture and food systems particularly in the Shire Valley basin. However, the anticipated positive outcomes are bound by low capacities to ensure sustainability of water resources, management issues and modalities, non-resilient irrigation infrastructure, and biophysical and socioeconomic factors that augment climate change risks. For instance, floods from Tropical Cyclone Freddy affected the project in 2023 and Tropical Cyclone Ana damaged part of the constructed intake foundation in 2022, prompting redesign.

The SVTP is also an example of how water resource priorities compete with hydropower generation and ecosystem requirements at the Elephant Marsh, downstream. The project has also identified other complexities. Evidence suggests that management of the lake level could face increased risks due to a combination of climate change and increased demand for water use with agricultural intensification.[148] This suggests that new vulnerabilities could be created while meeting the intended programme goals.

Sustainable Agriculture Production Programme (SAPP) II

SAPP II (2024-2030) aims to commercialise agricultural production and enhance the resilience of smallholder farming systems. It is being implemented in Lilongwe, Balaka and Dowa and Mzimba districts (see Map of Malawi, Figure 5.4); it aims to support selected value chains for markets and job creation, and improve incomes and nutrition. Partnerships with financial institutions to improve credit access are an important factor. However, adoption of climate smart practices, while crucial for protecting farmers from the adverse effects of climate change, are likely to become less attractive to farmers once incentives are phased out. That raises concerns around the sustainability of the outcomes, particularly where there are already many examples of low adoption.

Agricultural Commercialisation (AGCOM II)

Malawi's AGCOM II aligns with the African Union's Food Systems Resilience initiative, aimed at enhancing agricultural productivity and market linkages in Malawi. The project supports marketing of high-value agricultural products, and food security through the income pathway and increases in household resilience. It provides last-mile infrastructure such as rural feeder roads, agro-processing equipment and electricity connection. It adopts a Productive Alliance (PA) approach, matching grants, credit guarantees and capacity building. The requirement for producer organisations to find an off taker on their own has been difficult for some emerging producers with no experience in finding markets, but the expansion of digital platforms has been vital in helping to connect market players. The project provides imported machines to farmers, but they often remain dormant due to a lack of expertise, locally available spare parts, and necessary private sector support services.

Transforming Agriculture through Diversification and Entrepreneurship Programme (TRADE)

TRADE (2019-2026) aims to strengthen value chains and rural commercial development through sustainable producer-private partnerships. It aims to match grants, promote good agricultural practices and climate-smart agriculture, establish partnerships with financial service providers, link value chain actors to markets, and undertake policy dialogues and regulatory reform. It is targeting women and youth in 11 selected districts to expand their businesses – for example associated with use of developed road infrastructure, warehouses, milk bulking centres, livestock markets and honey storage centres. The programme is positioned to help achieve Malawi 2063's inclusive wealth creation and self-reliance vision. However, fiscal slippages leading to high cost of living, cost of production and negative climate feedback evident in perennial floods and droughts, are slowing down efforts to build resilience among the targeted people and the transformational processes involved.

Greenbelt Initiative (GBI)

GBI aims to boost agricultural productivity and economic growth by utilising water resources for irrigation farming, thereby mitigating the effects of climate change on food and nutrition security. The programme focuses on irrigation infrastructure rehabilitation, land administration, and technology development. The efficient and sustainable utilisation of water resources can contribute to food-systems resilience, but challenges relating to land security, limited use of advanced agricultural technologies, and adequate financing hinder its progress.

National Aquaculture Farm Development

The National Aquaculture Farms Development is supported by the Aquaculture Value Chain for Higher Income and Food Security in Malawi (AVCP), a collaboration between the Department of Fisheries and the German Federal Ministry for Economic Cooperation and Development (BMZ). The programme also benefits from the Harmonized Aquaculture Training Manual and the SADC Aligned National Aquatic Animal Health and Biosecurity Strategy, both of which promote best practices in aquaculture. The programme directly supports diversification of diets of Malawians through increased fish production, creation of jobs in the aquaculture value chain, and reduced dependence on imports from neighbouring countries. Major challenges include limited financing and infrastructure which compromises the quality of outputs and services being rendered to smallholder farmers.

Despite these challenges, this initiative significantly contributes to the transformation of Malawi's food systems by reducing overfishing and promoting sustainable aquaculture: both of which are key to improving nutrition, supporting incomes and wealth creation, and enhancing the economic self-reliance of households.

Mega Farms

The Government of Malawi is implementing large-scale farming in the form of 'mega farms'. Various crop and livestock enterprises have been earmarked to be operationalised by estate farmers, cooperatives, and universities. With a mean land-holding size of 500 to 1000 ha, mega farms are expected to contribute to the country's food security and exports, whilst providing capacity development for small-scale farmers through mechanisation and input support programmes. The Ministry of Agriculture oversees the administrative and governance of this initiative. This has attracted criticism in some parts of society with complaints voiced about political interference in the operationalisation of the programme. Such concerns could potentially affect the sustainability and delivery of the programme's goals.

Kholongo Irrigation Multipurpose Dam project

The Kholongo Irrigation Multipurpose Dam Project involves the development of a comprehensive water supply system, and the creation of an efficient irrigation network, complemented by the establishment of fish farms. Together, these have the potential to strengthen the resilience of households. The programme will improve access to potable water for over 153,000 people in Mponela and nearby areas, and enhance the livelihoods of 4,400 households through irrigation and fish farming. A key aspect of resource optimisation, is about ensuring that water is available for multiple uses including drinking, irrigation and industrial purposes in an environmentally sustainable manner. Like the SVTP, the project is still in construction. It is therefore yet to be seen how the complex interconnectedness between water resources used for multiple purposes would affect – or potentially disrupt – other equally important livelihood activities. Also, the dam construction may lead to community relocation and ecosystem

disruption, potentially causing social and environmental effects. This argues the need for a balanced and careful approach.

Bakhresa Oil Production Factory

The Bakhresa Oil Factory, a US$100 million private sector investment, plans to process 150,000 tonnes of soybeans annually into cooking oil, providing a reliable market for local farmers, creating employment opportunities and boosting foreign exchange earnings. However, the potential of the project to contribute to the transformation of food systems may be constrained by fluctuating global commodity prices, unstable supplies of soybeans from local production, and issues around power supply. Extension of the project to other oil seed crops such as sunflower and groundnut could diversify associated risks.

Hydropower Flagship Projects

The Government of Malawi, through the Ministry of Energy, is advancing several hydropower projects, including Mpatamanga Hydropower Project, designed to generate 350 megawatts (MW) of electricity, and executed as a Public-Private Partnership. Complementary projects include the Kholombidzo Hydro-Power Project (210 MW), Lower Fufu Hydro Power Project (261 MW), and the Songwe Dam and Hydro Power Project (180 MW). The plans for power connection between Malawi, Zambia and Mozambique could be essential to stabilise power supply. All such projects aim to address energy insecurity and stimulate economic growth by providing reliable electricity for domestic and industrial use. Reliable energy supports irrigation, processing, storage and transportation, thereby boosting agricultural productivity. Challenges include delays in securing financing, and also regulatory and community engagement issues associated with the need to mitigate environmental and social impacts. Expansion of the Malawi Rural Electrification Programme will ensure that remote areas have requisite power to support industrial and agricultural activities, and more generally for transforming food systems and strengthening their resilience.

5.3 Threat assessments

Two priority threats to Malawi's food system transformation identified in the project's stakeholder meetings were namely climate change and institutional and governance factors. The threat of climate change and associated variability, poses grave risks to food systems trying to deliver nutrition and sustainable, healthy diets. Economic activities related to food production and energy generation will be affected by increases in demand for water resources occasioned by projected rise in global and local temperatures. The frequency and intensity of droughts, floods, pest and disease incidences pose challenges to hydro-energy generations and agricultural production – close to 80% of smallholder farmers depend on a single rainy season.

Agricultural production is already failing in some parts of southern Malawi due to erratic rainfall and dry spells in periods with El Niño weather.[149] Population growth, and its associated increases in food demand, places further pressure on food systems, leading to clearing of land for agriculture, affecting land use and land cover patterns. Soil erosion, siltation of rivers, and washing away of agro-chemicals, have reportedly affected downstream activities including hydro power generation, and have led to clogging and dry-ups of some water bodies like Lake Chilwa. National crop production estimates were recorded at their lowest in 2023/24 by 23% against the five-year average with widespread food and nutrition insecurity affecting close to four million people (MVAC report), as well as businesses reliant on local supplies.[150]

Persistent hunger is a threat to peace and could escalate insecurity. This is a particular concern for 2025, being a presidential election year. Also, the implementation of long-term strategies may not be popular with political patronage, hence constraining the policy space for effecting the changes needed. For instance, three decades of implementing input subsidy programmes have had positive effects on national food self-sufficiency mainly when the country experiences good weather conditions. But there is also contrary evidence that questions the opportunity cost of such investments to build more longer-term resilience to climate change. Overall, a balance between emergency response, social protection and development finance is needed. Labour productivity off season, could be increased by engaging communities in food and cash assistance for conservation activities such as building canals and dams. Over years, this would help set up the basic infrastructure needed for sustainable growth, and building community resilience – instead of handing out food or cash for free.

Evolving constraints to institutional and governance structures also pose a threat to food systems. Of particular concern is macroeconomic instability characterised by low economic growth, high inflation, and devaluation of the Kwacha. The poor performance of the economy drives the cost of production, which is high for both households and firms. Smallholder farmers are more vulnerable: increasing costs of inputs, chemicals and technologies put them in a low productivity trap. This risk is heightened further, due to the low rates of adoption of sustainable agricultural practices, and the unavailability of other innovations. Coupled with low exports, the generation of foreign currency has

been a challenge. This is particularly concerning as most industries, for example, rely on imported materials for packaging.

Empowerment of communities through economic activities appears difficult in the face of climate change effects and economic underperformance. Agri-value chains have been affected by the former – reinvestment in business is absent, asset value is being lost, and the government fiscal space is shrinking. Due to El Niño effects, the on-set of lean seasons are earlier than in a typical agricultural season. Survival through short-term agricultural employment is also a challenge due to unavailability of employment opportunities. The high cost of living in Malawi makes it difficult for households to afford healthy diets and pervasive poverty is constraining dietary choices further. The situation is made worse by lack of coordinated mechanisms to build resilience capacities for food systems transformation that would create better outcomes for households and the economy. Stakeholders consulted in this project have cited inadequate capacity for cross-sectoral programming and implementation – policy announcements have not been matched with the much-needed funds, functions and functionaries to effect the needed changes. Other stakeholders argued for revisiting the political financial settlement to ensure resources are better deployed where they would be most productive and with greater multiplier effects. A summary of current interventions to address threats relating to climate change and institutional governance is shown in Box 5.2.

Box 5.2: Interventions to address threats around climate change and institutional governance.

The Government of Malawi and its partners, is implementing a number of interventions to build resilience capacities. Examples include:

- Investments in transformative programmes like the SVTP that will change fundamentals for agricultural production within the Shire Valley Lake Basin.
- In anticipation of the threats, early warning systems have been activated and investments in flood control and risk reduction are being implemented through public works programmes.
- Further social assistance programmes are being instigated and refined. For example: cash transfer programmes which encompass both protective and productive transfers; the Affordable Inputs Programme is being reviewed to improve beneficiary targeting and repurpose it for soil health improvements.
- An enabling policy and regulatory environment is being created – seen in enacted laws (on land, gender, property ownership).
- Institutions and programmes are being created to address financing constraints – such as TRADE, AGCOM, Malawi Agriculture and Industrial Investment Corporation (MAIIC). Together these aim to promote rural financing of innovations, improve exports and support importation of required materials for agro-processing. However, Malawi needs very substantial investments in sustainable development around the flagship programmes to bring transformative change.

5.4 The state of resilience in Malawi's food systems today

The following discussion assesses the state of resilience in Malawi's food system today. It is structured according to the framework for thinking about resilience which was set out in Chapter 2 which encompasses five dimensions: agroecological, supply chains, household, community, and institutional.

5.4.1 Production resilience based on agro-ecological conditions

The availability of water resources is a crucial factor in ensuring resilience based on agro-ecological conditions. The main source of water for a wide range of sectors and ecosystems is Lake Malawi and the Shire River basin. Together, they provide essential water for power generation, agriculture, and domestic use. They are also vital to maintain the ecosystem. Huge infrastructure development completed at the Kamuzu Barrage in Liwonde aims at regulating and influencing the reliability of the flow of water for downstream activities, including hydro-power generation and irrigation. Through irrigation, water resources can contribute to the resilience of agri-food systems and their transformation, in the face of devastating effects of climate change affecting the country.[151] However, to date, abundant water resources have not been adequately exploited to support agricultural production. As of 2015, the estimated land under irrigation stood at 104,000 hectares, which represents 4% of all arable and 26% of potentially irrigable land. Recent indicators show substantially increased smallholder farmers' irrigated land, quadrupling from 15,988ha in 2011 to 61,977ha in 2019.[152]

Recent investments in irrigation schemes, consistent with MW2063, the Green Belt Initiative, and the Mega Farms, depend on streamflow, and present challenges for irrigation development. According to the National Irrigation Policy,[153] uptake and use of irrigation by farmers is limited owing to the high cost of irrigation equipment, financing challenges, quality of extension services, and access to water. The distribution of water resources is also variable and highly influenced by climatic variability and extremes. Thus, while water resources may be abundant for use in agriculture (and other purposes) in some areas, there is a scarcity elsewhere. In addition, the choice of crops to irrigate have varying returns to the irrigation investment.

Climate change presents significant difficulties to achieving production resilience through agro-ecological means. The southern part of Malawi is projected to experience more significant drying than the northern region, and mean annual rainfall will decline by 10%. This presents challenges for crop production and water availability.[154] The frequency of droughts has also increased and is characterised by low dry-season stream flows in most parts. An exception is the Shire River, because Lake Malawi acts as a buffer pond, making dry season flow only fall to 60% of the mean annual flow. The seasonal contrast highlights the need for planning around periods of less water availability. For example, significantly reduced water levels in Lake Malawi and flows across the Shire River basin in 2016 led to challenges

in hydro-power generation, an important driver of agri-food systems transformation. In the 2023/2024 season, most parts of the southern region experienced conditions of drought owing to one of the strongest El Niño events, while the north received high amounts of rainfall.

Further, drying trends in southern Malawi means a reduction in the effective rainfall and an increased irrigation water demand. Analysis shows that about 4.2 million people are at risk of hunger due to the El Niño phenomenon.[155,156,157] Previous droughts of considerable magnitude had been experienced in 2015/16 and in 1978/79, 1981/82, and 1991/92 with major impacts on crops, and livestock.[158] The impacts of the drought in the 2023/2024 season have been made worse as the country, and the southern part specifically, is still recovering from the impacts of Tropical Cyclone Ana and Freddy.[14,15] The pace of recovery from the consequences of these events has been slow, presenting considerable risk and difficulties to the recovery process, thereby significantly undermining efforts to rebuild more effectively.

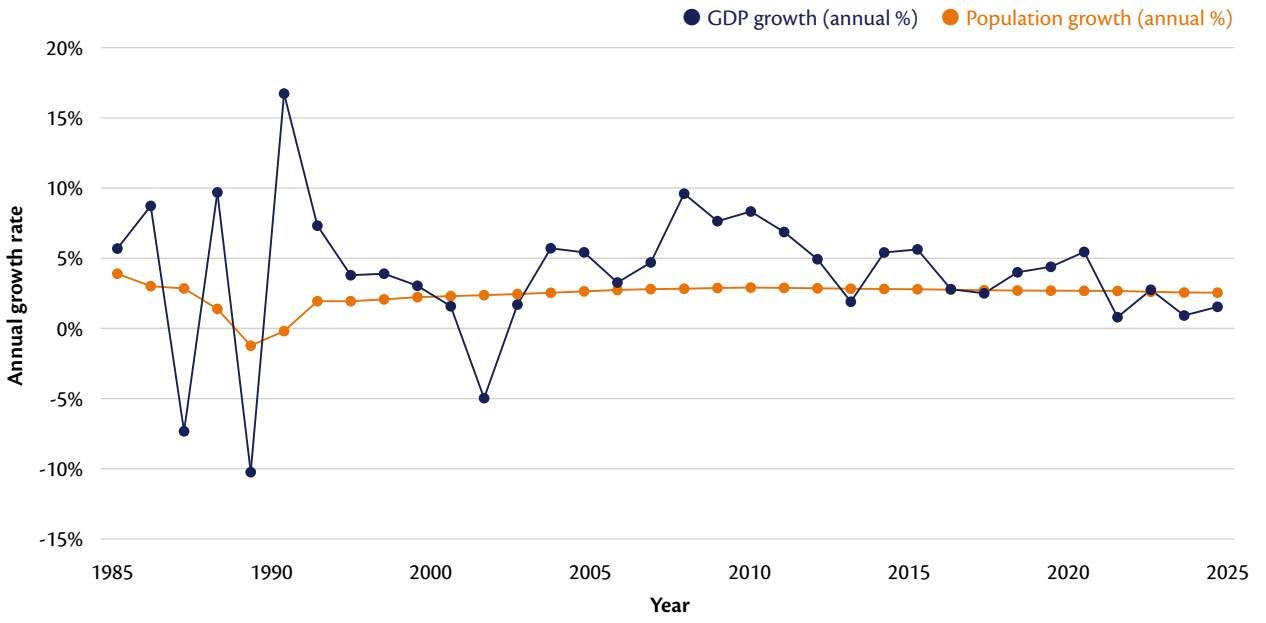
Production resilience is also threatened by changes in land use and land cover driven by the need to expand agricultural land.[159]Bare soils enhance erosion and run-offs resulting in river siltation and eventual clogging of turnouts and reduction of conveyance capacity for irrigation scheme canals. In some instances, silt and sediments may be deposited in the fields effectively reducing their potency and size. An irrigation scheme in the Lake Chilwa basin in Zomba district is an example highlighting how upstream catchment degradation is detrimental for downstream irrigation schemes. During the years 2012, 2015 and 2018, Lake Chilwa had episodes of 'dry ups' (see Figure 5.4). This highlights some of the most extreme impacts of environmental shocks on water resources; with consequential impacts on food systems that support livelihoods of over two million people through fisheries, agriculture, and water transport.[160] More disruptive were the effects on transport of goods moving between the mainland, Lake Chilwa and Chisi Island, as well as movements to and from the Malawi and Mozambique sides of this transboundary lake.

Climate change, land use and land cover change pose significant threats to water resources from the supply side. In contrast, demand side pressures are generally associated with population and economic growth. Malawi's somewhat erratic economic growth, coupled with relatively steady population growth are driving increased food demand (see Figure 5.3). The per capita demand for water resources for Malawi is estimated at 307 litres/household/day (urban) and 107 litres/household/day (rural), assuming an average household size of 4.5 persons.[161] A steady population increase implies an increase in domestic demand, putting considerable pressure on water resources. Investments in irrigation should therefore seek to optimise the use of water resources, conceding the pressure from other factors including population growth and climate change. In essence, climate-sensitive policy and programmatic options, drawing on foresight trends of all elements impacting water resources, are needed to ensure Malawi's water resources management is resilient.

5.4.2 Consumer and household resilience

Malawi's dietary and nutritional practices are deficient in some respects, with pregnant and lactating women, newborn and young children especially disadvantaged. Some traditional customs and practices perpetuate discriminatory tendencies with regards to food access and consumption. For example, in some instances, men seemingly have a right to better food relative to other household members. This may manifest by being served more side dishes, choicest meat/fish/poultry; while women and children are forbidden on account of cultural beliefs.[163]

Figure 5.3: Population versus economic growth in Malawi



Source of data: GDP and Population growth figures are sourced from World Bank Development Indicators (WBDI)[157]

Figure 5.4: Map of Malawi showing regional and district boundaries

Source: National Statistical Office (NSO) Malawi

Despite nutrition indicators showing a positive trend (Figure 5.5), they remain comparatively high. For instance, the proportion of stunted under-five children reduced from 47% to 36% between 2011 and 2019 (UNICEF, 2020).[3,164] However these, estimates are still above the 30% Africa-wide prevalence Africa-wide in 2022. Prevalence of zinc deficiency is high, roughly 60% for different gender categories preschoolers, school aged children, women and men (20-55 years old).[165]

The risks of other deficiencies like selenium vary by locality, with Nsanje and Chikwawa districts unlikely to have selenium deficiencies suggesting local factors at play.[166,167] Progress has been made to reduce vitamin A deficiency from 60% down to 4% of the population. This is owing to fortification efforts for sugar and other food products. Nutrition challenges are grounded in unchanging nutrient consumption and dietary patterns. The main source of protein for diets of most Malawians remains cereals (maize) which presents risks of likely undernourishment.[168]

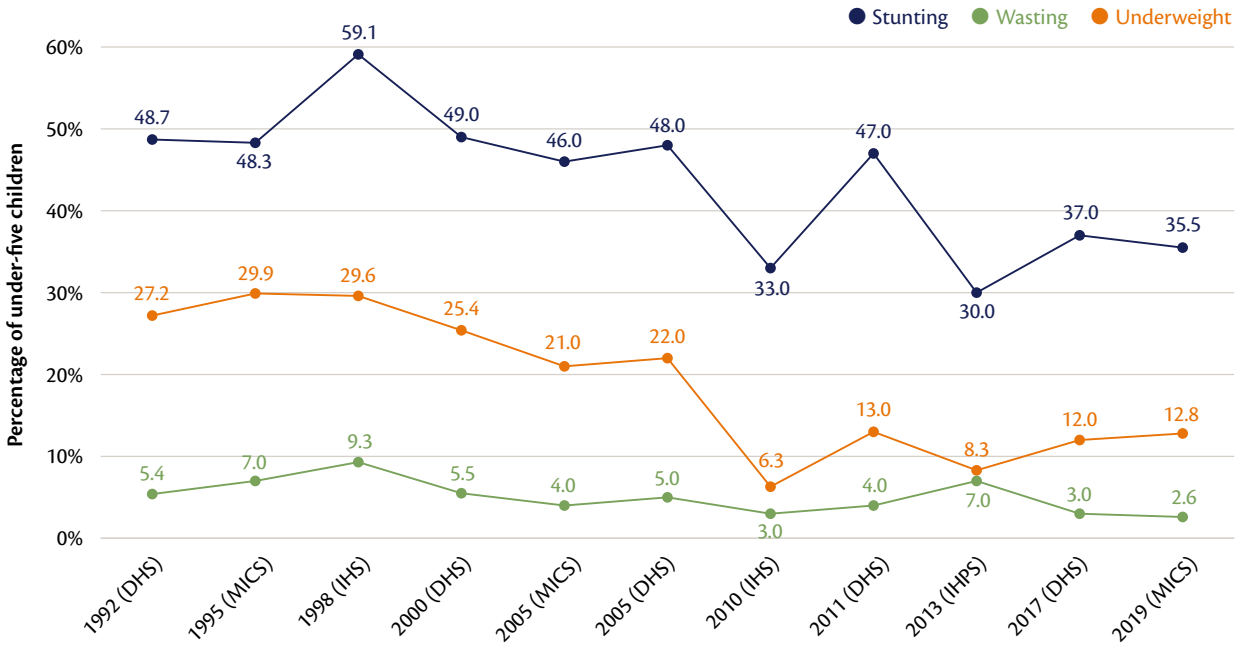
Animal sourced proteins are rarely consumed, and cereals continue to dominate diets according to 2019/20 surveys. Increasing intake of a carbohydrate diet is associated with the triple burden of malnutrition – undernutrition, vitamin and mineral deficiency and overweight and obesity.[169,170] Evidence suggests that the prevalence of obesity is growing in Malawi, with high prevalence among women (12%).[165]

Malawi's preparedness to deal with the health burden associated with the lack of safe and high-quality diets is poor. This situation is augmented by food production and distribution challenges, national fiscal slippages that have seen a sharp rise in the cost of living, and compromised food access and consumption patterns that lead to poor nutrition status among children and women. The hunger situation in Malawi is rated as 'serious' by the 2024 Global Hunger Index.[171] These nutritional outcomes are embedded within diverse other problems affecting the country – such as the devaluation of the local currency, cholera, COVID-19, and Tropical Cyclones Ana and Freddy. The poor state of nutrition requires urgent action to transform food systems to ensure sustainable, healthy diets are available to all, leading to better health outcomes. This is especially important because the food production systems have shown to be less resilient to climatic and economic shocks in Malawi.

5.4.3 Community resilience

Community resilience has improved due to increased investment in the organisation of smallholder farmers. More farmers are being certified as cooperatives by the Ministry of Trade and Industry, and enabled through extension services, to participate in productive alliances. Such initiatives enhance resilience against low production and market price volatility induced by climate change effects. To address dependency, matching grants are used which require farmers to contribute at least 30% of the investment. Farmers mobilise themselves and pool resources for a shared cause. This approach is also used in community-level interventions such as village banks and catchment management. There are variations among communities with those along water basins exhibiting more resilience to negative climate feedback and volatile macroeconomic conditions. This is due in part, to the wide range of livelihood activities they undertake, in comparison to locations in rain shadow areas, such as Balaka, Ntcheu-Manjawira side or Machinga where dry-spells are common. The government categorises agricultural production locations

Figure 5.5: Trends in nutrition indicators in Malawi



Source: Various Demographic and Health Surveys and Multiple Indicators Survey by the National Statistical Office[159,160,167]

according to agroecological zones although in some instances implementations of projects have not reflected such different comparative advantages.

One example is the Affordable Inputs Programme, which provides smallholder farmers with improved maize seed and inorganic fertiliser. Though massive investments have been made in the programme, the returns have been somewhat wanting as Malawi continues to experience food insecurity with rising malnutrition. The programme's non-strategic implementation, inadequate capacity of beneficiaries to optimally utilise inputs, a lack of technology and innovation, and a focus on maize are among key factors contributing to its inability to respond to changing climatic conditions. Sorghum, millet and cassava could support the resilience of local food systems in the lower Shire and Nkhata Bay districts, for example. The current dominance of maize argues for efforts to transform food-systems resilience to promote production that is more diverse.

5.4.4 Agri-value chains – private sector role in food industry

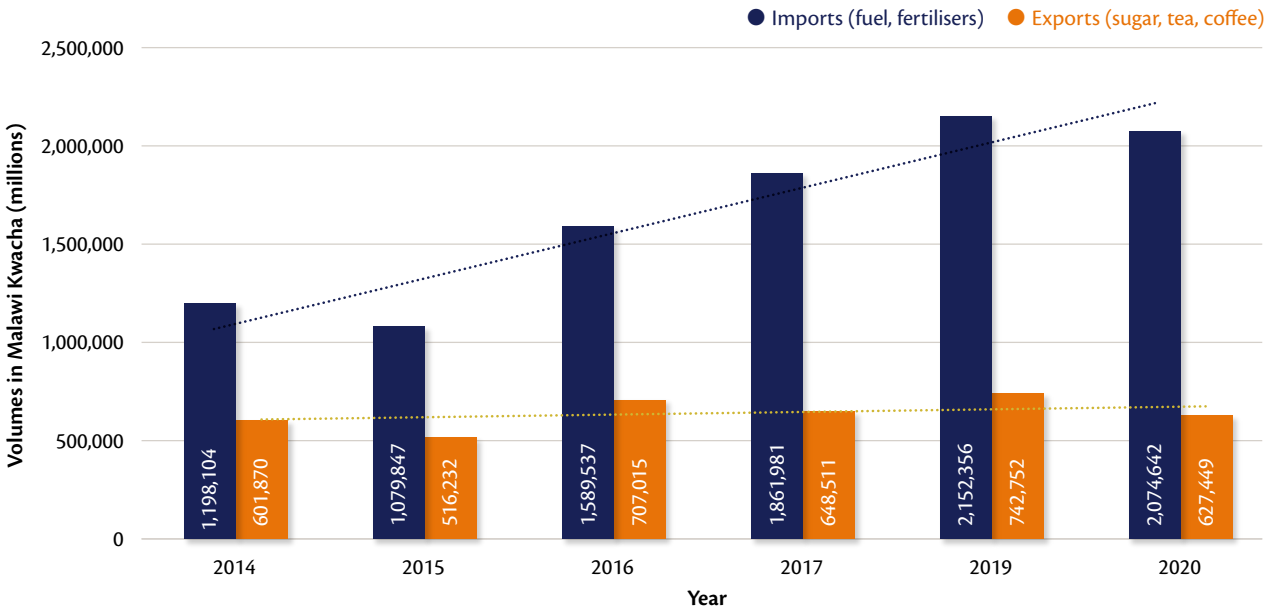
The success of Malawi's food system transformation, especially in enhancing production and access to foods that promote both improved nutrition and incomes, relies on Agri-value chain resilience. The Index of Industrial Production (IIP) increased by an average 13.7% between 2022 and 2023, with food products manufacturing contributing 69% of the increase.[163] This growth in the food industry is evident from market volumes, revenues, and number of players – all are on the rise. Yet between 2010 and 2018, 80% of the food and beverages were imported.[173] This suggests the existence of an untapped market that if aggressively pursued, could also assist management of trade deficits. The increase in importation of food compared with exports, has resulted in a significant trade deficit that has implications for food systems, especially in terms of direct consumption and agri-value chains. Agricultural production provides 90% of the food supply and most of the food available at household level is from own production. Overall, Malawi is a net importer (see Figure 5.6).

Efforts continue to be made to harness private sector involvement in the food systems transformation process. Micro, small and medium enterprises are increasingly being involved in food processing and value addition. Other large scale processing industries include milling industries, sugar refineries, tea processing, and brewing companies such as Illovo Sugar, Salima Sugar Company and Sunbird Foods operating either under national or multinational brands in domestic and export markets. The country's traditional and informal businesses are key for driving innovation, creating jobs and improving food availability and quality.[174]

Strategies to build a resilient food system transformation through agro-processing involves transforming the role of private sector in food systems, which must address a myriad of challenges constraining progress including financial instability, inadequate infrastructure, limited access to modern technologies, and exposure to external shocks such as pandemics and economic downturns. All of this is consistent with Malawi's industrialisation agenda, which aims to graduate micro and small enterprises to medium enterprises, and medium enterprises to large scale enterprises.

SMEs are often the most vulnerable to shocks and face significant barriers to scaling their operations.[175] The food industry relies heavily on power, with intermittent supply potentially causing business losses. ICT use is less prevalent, and acquiring equipment is costly, time-consuming and regulated. As such, businesses must confront high transport costs, foreign

Figure 5.6: Malawi's imports and exports trends; 2014-2020



Source: National Statistical Office (NSO) Malawi 2023

exchange unavailability, regulation for customs, import licences and compliance standards for which sometimes information is not readily available. All of this makes the cost of doing business high in Malawi relative to other countries.

The government's tax incentives to encourage new investments have been questioned as they are often taken advantage of by existing businesses to expand their operations.[176] Human capacities for the sector also need to be enhanced. For instance, maintaining imported equipment is a problem due to unavailability of requisite capacities. Technical support is needed in: research and development; quality control; packaging and maintenance of equipment; advancing the use of precision agriculture; climate-smart practices; and digital platforms. Additionally, food safety is a concern, particularly when products lack clear labels or processing sites do not adhere to Malawi Bureau of Standards (MBS) standards.

As regards inputs for agro-processing, most raw materials are sourced locally as opposed to importation, although local supply chains can be unstable. Many businesses reinvest their profits to meet financing requirements due to absence of collateral and high interest rates. Government borrowing crowds-out private sector credit access, increasing the risk of agricultural financing, which makes the sector fail to attract funding. Alternative financing had been secured through public-private partnerships; however, such engagements remain weak. The private sector is hesitant to engage in PPPs due to concerns over political instability and market volatility, which increase the perceived risks of investing in long-term projects, weakening the resilience of food systems in the context of agro-processing.[171]

Progress was recently registered on the marketing front with establishment of Warehouse Receipt System (WRS), Agricultural Commodity Exchange for Africa (ACE) and Auction Holdings Limited Commodities Exchange (AHCX). These would be key to building resilience into agrifood systems transformation as they support management of post-harvest losses, storage, and can use the stock as collateral for credit access and pursuit of lucrative markets. However, IFPRI surveys showed few farmers use Comex, WRS or other structured market operations. The range of crops trades is also a concern and consists of mainly maize, soya beans and pigeon peas. Large traders and processors dominate the warehouse receipts issuance and tonnage deposited which may exclude small traders, farmers and farmer groups.

Poor farmers' group organisation and lack of market information appears to aggravate barriers to farmer commercialisation in Malawi.[177] The Agriculture Development and Marketing Corporation (ADMARC) presents an alternative entity with similar services, but the entity faces operational challenges to balance its commercial and social obligations and secure relevant funding for its operations.[177] Transport infrastructure investments i.e. road and rail would also be key to facilitate positive value chains performance including cold storage enabled facilities. The Government has already earmarked some roads for upgrading, linked to flagship programmes for instance the Chikwawa-Chapananga-Mwanza Road, Nsanje-Marka Road and railway rehabilitation – which would support movement from the Shire Valley Transformation Program (SVTP) locality and ensure food supply chains are resilient.

Key reflections from stakeholders' consultations in this study suggest improvements of the market functions of ADMARC through enhancing its capital outlay, technical competencies for market-oriented operations and policy reforms that will allow the entity to function as a quasi-business enterprise. The need for fit-for-purpose access roads has been emphasised in Malawi's vision and road infrastructure programmes, lining up main transit and access roads for local and international export markets. The recently commissioned and launched 'one-stop-border' post between Malawi and Zambia in Mchinji highlights one of the decisive actions governments has undertaken to ease pressures and logistics associated with cross-border trade towards enhanced market dynamism for transformed food systems in the confines of national development.

5.4.5 Food systems governance

Delivering food systems responsive to negative climate feedback, amid uneven macro-economic fundamentals as per Malawi's experience, require impact-oriented and cross-sectoral governance systems. The 2021 UNFSS's call to member states to view food systems transformation as a key catalyst to achieving SDGs by 2030 signalled a higher-level political will and commitment. However, action towards operationalising targets for such transformation has been rather slow and uncoordinated. The Ministry of Agriculture became the convenor of the food systems transformation programme following a presidential directive, and much more guided by the understanding that the initiative is the purview of one sector: agriculture. However, a refreshed understanding of the cross-sectoral nature required in food systems transformation has questioned the cross-sectoral coordination function of the Ministry on food systems transformation. Bilateral discussions with stakeholders indicated that, although the Ministry of Agriculture is the convenor, some other ministries have not been part of the conversation on food systems transformation suggesting the need to increase the number of actors in this space to improve collaboration.

It was also suggested to extend the discourse to local governance structures which have been excluded from the food systems transformation discussions, yet are key to its implementation. The resultant response has been other sectors' resistance to operationalise food systems transformation action tracks, leading to weak tracking of progress being made on interventions, poor synergies among players in the food systems space, unintelligent use of financial and technical resources for operationalising the food systems transformation programme, and a lack of harmonised targeted efforts to measure the impact of the interventions on the transformation of Malawi's food systems. Among reported instances are the 'silence' on implementation of food systems activities in 2022, following the release of a vibrant synthesis report that outlined food systems pathways – a clear demonstration of leadership glitches in terms of coordinated activities to operationalise the recommendations of the report.[178] Further, since the production of a draft Investment Plan for the Food Systems Transformation Initiative, there has not been efforts to validate the plan with stakeholders, as sectors shy away on account of alignment of the plan's issues vis-a-vis the agriculture sector.[179]

Prior attempts at instituting a governance mechanism for the food system include the proposal made in the Food Security Policy of 2000 for a National Food Security Council. However, this was never implemented due to concerns about duplication of agriculture ministry roles. Similarly, the National Resilience Strategy (2018-2030) is a bold attempt at cross-sectoral integration of government technical sectors with detailed coordination mechanisms to manage and deliver multisector programs aimed at building resilience. Developed in the context of food insecurity and increasing resource mobilisation for humanitarian work/emergencies, the policy recognised the need for a shift from responsive to preventive approaches.

The inclusion of seven ministries of finance, agriculture, transport, natural resources, gender, health, and local government harnesses the sectoral approach to building resilience capacities clearly indicating a range of indicators, some bordering on food systems transformation for nutrition. However, its development is not encompassing enough to support food systems transformation. For instance, the trade ministry is not included which is key for promoting agro processing; and the reference to food systems does not exhaustively cover the complex interactions of the various domains of the food system. Again, there are problems with its implementation given the strategy is based in the Department of Disaster and Management Affairs which does not have mandate over other sectors. The alignment of the strategy to disasters has also resulted in 'cold feet' in operationalising the strategy as it limits cross sectoral participation owing to its reactionary than proactive programme focused nature.

Stakeholder engagements in this project to resolve the governance challenge in Malawi's Food Systems transformation recommended repositioning the coordination function to institutions with overarching mandates in the development of the country i.e. the Office of President and Cabinet and the National Planning Commission (NPC). This was on account of their convening power and capacities on overarching development programmes oversight. This would help to foster efficiency that would ensure impact of interventions in the food systems programming. The placement of such a coordination role in the Office of President and Cabinet (OPC) has previously worked for the Department of Nutrition, HIV and AIDS (DNH) that was moved from the Ministry of Health to OPC and led to successful nutrition interventions like the Scaling Up Nutrition programme with positive outcomes.

The placing of the coordinating office in the OPC could take different structures including a separate Food Systems Delivery Unit or expanding the scope of the existing Presidential Delivery Unit. It could also mean a separate institution outside the OPC but with the mandates and reporting structures to the OPC. An inter-ministerial committee on food systems, established under presidential directive, could be another coordination option. However, a dedicated secretariat or separate institution is needed for effective monitoring. Malawi has prior experience with such committees that could be used to determine a workable arrangement.

Some stakeholders observed that elevation of the food system transformation to a higher office might help, but more impactful

would be to cascade policy into action as expressed *'another policy brief will not change Malawi'.* Therefore, proper functional and political economy analysis of the different arrangements would be needed.

Despite transformative proposals, there has been little movement to effect the changes needed. This has led to continued limited collaboration among players in the space, lack of accountability on resources and technical investments being made to transform food systems, and blurred understanding of what Malawi's food systems are achieving over time. There are institutional responses i.e. Department of Disaster Management Affairs (DoDMA) and the Department of Social Protection in the Ministry of Finance and Economic Affairs (MoFEA) which employs a food systems transformation approach to address increasing food deprivations and dwindling food production capacities among households in the country. DoDMA for instance provides safety nets and disaster response programmes that step in during major crises e.g. tropical cyclones, poverty due to high cost of living resulting from changes in macroeconomic fundamentals. The Ministry of Agriculture implements the National Agriculture Investment Plan (NAIP) that is monitored through among other platforms the agriculture Joint Sector Reviews (JSR).

The development partners on their part coordinate their efforts supporting the implementation of the NAIP through the Donor Committee on Agriculture and Food Security (DCAFS). However, given the scope of food systems transformation and resilience, the committee might need to reorganise itself, for example to draw in other players to champion quick wins that would catalyse the much needed transformation. A further idea for consideration may also include establishing a trust fund for food systems transformation, drawing lessons from implementation of Agriculture Sector Wide Approach Support Project (ASWAp-SP); or repurposing available donor funds as suggested in stakeholder consultation.

To sum up, there are, therefore, gaps in coordination of the institutions and their partners to deliver effectively using a food systems approach that responds not only to a crisis or a single domain of the food system but builds resilience among households, communities and institutions in bouncing back better against experienced challenges. However, while there have not been significant changes in the collaboration and coordination with regards to transforming food systems, there is a clear recognition for the need. This emerges strongly in the context of increasing climatic challenges that not only affect food access, distribution and consumption patterns, but even the economy, owing to the interlinked sectoral lines that are required to deliver a functional and impactful food system. There is a need for effective cross-government governance structures and capacities for food systems transformation and resilience, as current approaches often aligned to sectors, or operated in silos, render the food system less resilient. A cabinet position paper discussing the context of food systems governance and recommending fit for context models to address systemic challenges in the food systems space is currently being developed, as part of the initiative to reorganise the space for impactful transformation of food systems in the country.

5.5 Evaluating the resilience of food system transformation

5.5.1 Resilience of the transformation

Food systems are confronted with a myriad of challenges that range from natural and environmental, to artificial (man-made) macro-economic policy and programmatic factors. Together these require urgent attention if humanity is to survive the food insecurity terrain amid negative climatic feedback and macroeconomic instability engulfing the world today.

The food systems approach requires a clear mapping of its stakeholders' base, identifying key capabilities and competencies of each player towards transforming food systems and ensuring impactful changes in livelihoods of people towards desired ends. Beyond such a map are systemic and structural changes that ought to accompany strategic decisions and programmes designed to address various challenges confronting food systems and their transformational processes. Such structural changes relate to policies, laws and guidelines which would provide a requisite environment for an effectively functional food system, one that delivers the designed objectives.

Achieving sustainable and resilient food systems transformations requires functional and effective coordination of stakeholders to ensure harnessed synergies, and collaboration to leverage technical and financial capacities of all players in the food systems transformation process. The development space is multi-level, with stakeholders at each level confronted by different circumstances and contexts that inform their views and perspectives. Such levels include grassroot communities, frontline staff, district and national level stakeholders. Grassroots communities include households, farmers and farmer organisations, environmental and water resources management agencies i.e. water user associations (WUAs), downstream water users and community leaders. They also include financing agencies and those that provide capacity building for technological and innovation development in addressing food systems challenges. These diverse players are critical for the food systems transformation agenda as they operate at the level where policies are enacted. They are the primary basis for determining whether actions are having an impact, and an important source of feedback for improvements.

Frontline staff include extension workers, both government and non-governmental, who work closely with the farmers and other members of the community to implement policy actions. They are a vital conduit for passing extension messages and facilitating on-the-ground activities together with community leaders. Their role in facilitating or supporting efforts for food systems transformation cannot be overstated. This is because they link the media where policies and plans are propagated and enacted (i.e. by the grassroots communities) and where such plans and policies are formulated (i.e. the state). While they are more hands-on, with a limited role on development of policies and plans, those at the next level of decision-making need to recognise the value of the frontline staff in stakeholder bodies, in providing feedback on programme and policy

implementation. This would ensure that policies and plans are reflective of practical experiences that confront the grassroots communities. Frontline staff in the agriculture sector have more overarching roles, especially in relation to agriculture, water and natural resources.

Overall, their role is not limited to offering extension services regarding cropping systems. They are also involved in tasks that speak to catchment management, water resources, nutrition extension and agricultural commodity markets. The extent to which the food systems narrative informs their working perspective cannot be ascertained from a food systems concept and practice point of view, in which case they still consider themselves primarily agriculture extension agents focusing on either crops or livestock (in some cases both due to the nature of their work). This demands the need for capacity development if frontline staff are to work for the wider food systems spaces without entrenched views that govern their sectoral commitments. District level stakeholders mirror the national level stakeholders but with limited jurisdiction. For instance, government offices at the district level are in line with specific ministries, departments and agencies (MDAs). Both levels are generally involved in planning and resource mobilisation, albeit with different levels of authority.

The role of other high-level stakeholders starts to become apparent at this level. These include the private sector (for resource provision, supply of goods and services, and markets), academic and research institutions (for research and knowledge generation), and non-governmental organisations and the development partner community. Critical national level stakeholders include private sector organisations (such as estate farmers and producers e.g. Illovo), and water dependent companies including electricity producers and water boards. Their roles should be clearly defined to ensure alignment, transparency, and shared commitments to realise food systems transformation goals.

A systems approach to achieving these targets would help ensure that various stakeholders collaborate in cross-sectoral planning and action. This would not be without difficulties given that policies for relevant sectors are entrenched in sectoral priorities, with administration of such policies aligned to objectives of specific MDAs. The National Planning Commission (NPC) presents an effective body for cross-sectoral planning at the central level. Various MDAs would deliver on their mandates and objectives but with an underlying view that their efforts contribute to the wider food systems landscape. The coordination of food systems is seemingly aligned to the Ministry of Agriculture (given its coordinating entity role) but other MDAs ought to remain on-board if a systems and cross-sectoral approach is to be realised.

The NPC is a critical binder in that regard, but the level of decentralisation of its mandate to the district level may not be clear. Thus, without an institution that mirrors the NPC at the district level, the extent to which this coordination at the central level trickles down to the district level could be predicated on various issues and circumstances that ought to be identified and addressed. This would promote smooth coordination and flow information and resources from one level to the other.

Stakeholder networks and capacities work hand in hand with policies. The food systems narrative is relatively new and expectations that it is conspicuous in relevant policies may be over ambitious. A quick search of the phrase 'food systems' in the National Irrigation Policy (2016), National Agriculture Policy (2016), National Water Policy (2007), and the Climate Change Policy (2016) – all of which are the policies directly aligned to the discussion presented in this synthesis – yields no results. The same is the case for Malawi 2063 (2021) and its 10-year implementation for 2021-2030. Nonetheless, the theory of change for the National Resilience Strategy recognises the role of food systems in building resilience by referring to the pathways for impacts of agriculture on nutrition outcomes. Whilst the National Resilience Strategy aims to ensure all the food system actors are coordinated, it needs to be made clear how this will be directed to ensure its influence will benefit expansion of livelihoods activities, and crop production in context of the changing food environments for sustainable healthy diets.

Thus, more work is potentially needed to consider the complex interactions of the various domains of the food system, such as production, processing, and distribution. Policies within these domains, however, provide the necessary framework for actions towards achieving aspects of food systems transformation aligned to the different dimensions for ensuring resilience (as set out in Chapter 2): agroecological, household, community, supply chains and institutional governance. An assessment of the climate and irrigation policy landscape by Likoya et al. (under review) indicates that policies are a function of the time spent in drawing evidence from narratives related to climate change in policies adopted over the past two decades.[180] The cycle of policy reviews provides an opportunity for the effective integration of food systems narratives in relevant policies to inspire efforts towards cross-sectoral planning and action that food systems transformation demands.

5.6 Way forward

Previous sections set out a detailed analysis and suggestions for how governance can usefully be strengthened to better progress food-system transformation, and to strengthen resilience, both of food systems and the transformation process itself. This section builds upon that by setting out further critical actions, identified by experts and stakeholders involved in the present project. The specific actions are categorised as short-term (1-4 years); medium-term (5-9 years) and long-term (10+ years). Together, they provide a repository of ideas to contribute to a cross-government strategy to strengthen resilience of food systems in Malawi, and the resilience of its food-system transformation.

Both short- and long-term actions are critical to building resilient food systems in the context of climate risks – for example, for agricultural water resources use, and other aspects of the food system. As already noted, implementing these actions will require different responsible stakeholders working together – drawn from both the public and private sectors.

(a) Short-term (1-4 years) critical actions

Short-term actions include:

- Implement functional response actions in affected areas: this should build on the production potential to identify viable options that include winter cropping in areas where irrigation and residual moisture cultivation is possible. This would speed recovery from shocks.
- Consider the balance between response to emergencies, social protection and development finance; there is also the need to balance resilience building and social protection.
- Integrate disaster risk management, prevention, preparedness, building back better in programmes, policy and strategies.
- Facilitate effective cross-regional food transfer corridors through fair market structures and functioning transport networks.
- Facilitate water, sanitation and hygiene (WASH) interventions in areas with chronic water scarcity issues to minimise the risk of cholera and other disease outbreaks.
- Expand sustainable agricultural production (e.g. using climate-smart technologies, agroecological principles).
- Sustainably safeguard special ecosystems such as wetlands through promotion of green economy-based livelihoods (issues to consider include irrigation, food waste recycling, biodegradable packaging materials).
- Strengthen collaborative programming and management, with coordination structures that leverage synergies and explicitly weigh trade-offs.
- Aggressively promote and support the use of information on climate change and variability from the Meteorological department. The aim is to support preparedness.
- Extension to respond to meteorological information in anticipatory planning and preparedness (e.g. what crops should be cultivated given the forecasts; assessing risks and designing strategies for action).
- Improve economic capacity of consumers by promoting sustainable escapes from poverty (skilled workforce, entrepreneurship for different value chains, market access, business grants rather than social assistance).
- Promote agricultural industrial parks, integrating different actors including small and medium enterprises to assure availability of raw materials.
- Coordinate social responsibility investments to support resilience of livelihoods of surrounding communities.
- Facilitate programmes on legal clinics for small and medium enterprises, innovation incubation and acceleration centres, district council engagement, informal institution's role in social capital augmentation, agricultural extension services, business development services, and market information access.
- Identify and encourage champions for food systems transformation with a localised approach at regional and district levels.

(b) Medium-term (5-9 years) critical actions

- Restructure Technical and Vocational Education Training (TEVET) investments to support industrialisation agenda.
- Unlock climate financing, green climate funding and carbon tax funds.

(c) Long-term (10+ years) critical actions

- Develop sustainable and climate-smart irrigation. This should consider, for example: source augmentation, conservation agronomic practices, catchment management, efficient irrigation technologies, inter-basin transfers, and inclusive businesses.
- Adopt a systems approach within the water-energy-food nexus to identify synergies, weigh trade-offs, and assess mutual benefits of possible actions.
- Develop resilient rainfed agricultural systems.
- Implement strategies for soil health improvement.
- Develop and encourage crop insurance and efforts to navigate impacts of drought.
- Generate evidence of climate risks for irrigation, to support strategic interventions and inform policy choices.
- Finance mobilisation (e.g. utilising forestry and development management fund – this became effective in 2011/12 for conservation and management of forest resources).

6 Strengthening resilience in Ethiopia's food system: the Seqota Declaration

Key messages

Box 6.1: Overview of work conducted in Ethiopia

The goal of the work in Ethiopia focused on building and strengthening the resilience of the country's Seqota Declaration programmes. In preparing this chapter, the country team undertook a stakeholder mapping exercise and commissioned a series of technical reports relating to the five-fold resilience framework set out in Chapter 2. These reports were presented to a Stakeholder Workshop attended by participants from across government, civil society, and the donor community, with a view to reaching a consensus on priorities. After reworking the reports, they were presented at a second Stakeholder Workshop. The findings from these activities together with their implications are reported in this chapter.

This chapter outlines strategies to strengthen the resilience of Ethiopia's food system, specifically by building resilience into the implementation of the country's Seqota Declaration. A particular focus concerns the Declaration's goal to eliminate child stunting by 2030. Both challenges to, and opportunities for progress are discussed.

Ethiopia is subject to a particularly diverse set of threats and challenges. For agri-food value chains, these include extreme poverty, limited resource availability, rising living costs, internal conflicts, and climate-related factors. All of these affect society both at community and individual levels. The resilience of food production in areas covered by the Seqota Declaration and elsewhere is particularly affected by climate change, environmental sensitivity, biodiversity loss, soil degradation, and water management issues, as well as economic vulnerability. Additionally, gender inequality, financial exclusion, social and cultural barriers, and absence of mainstream disaster risk management present further risks to the Seqota Declaration's resilience.

To transform the Declaration into a cohesive strategy for enhancing resilience in Ethiopia's agro-ecological production systems, various integrated efforts are essential. The overall approach proposed emphasises collaboration, community engagement, and innovative solutions to address the complex challenges facing Ethiopia's food system.

6.1 Introduction to food systems and the Seqota Declaration (SD)

The Ethiopian Government is taking action to transform its food system through a multi-sectoral approach initiated at the 2021 UN Food Systems Summit.[181] It has identified challenges and prioritised 24 'game-changing solutions' to enhance nutrition, food safety, and sustainability; in doing so, it is involving over 120 stakeholders, leveraging the experiences of government sectors, private sector corporations, universities and research institutes, civil society organisations, and multilateral and bilateral institutions. This initiative has led to the creation of a national pathway document that aligns with existing policies, strategies, and programmes. The Seqota Declaration, which aims to end child stunting for children less than two-years-old by 2030, is a key component, and forms part of the 24 game-changing solutions.[182] The SD implementation encompasses the majority of the country (see Figure 6.1). Its vision is of a holistic transformation of its food system, moving through nature-positive production to sustainable consumption patterns that promote enhanced food safety, nutrition, and healthy diets. It also seeks to improve equitable livelihoods, preserve land, and build resilience to shocks and stresses. The implementation of the pathway involves leveraging strong collaboration among all food system actors, uniting around a common goal of healthy and sustainable diets for all.[181]

Launched in 2015, the SD aims to achieve its stunting target through close coordination and collaboration of sectors, communities and development partners. It is focusing on high impact nutrition specific and nutrition sensitive interventions, as well as influencing social behaviour through communications. Special consideration is given to cross-cutting issues such as gender mainstreaming, environment and integrated community development approaches.[182] The SD recognises that improving nutrition outcomes requires transforming the Ethiopian food system to ensure consistent access to nutritious, diverse, and safe foods. Within its areas of operation, it promotes food and nutrition services, which are also supported by the food system.

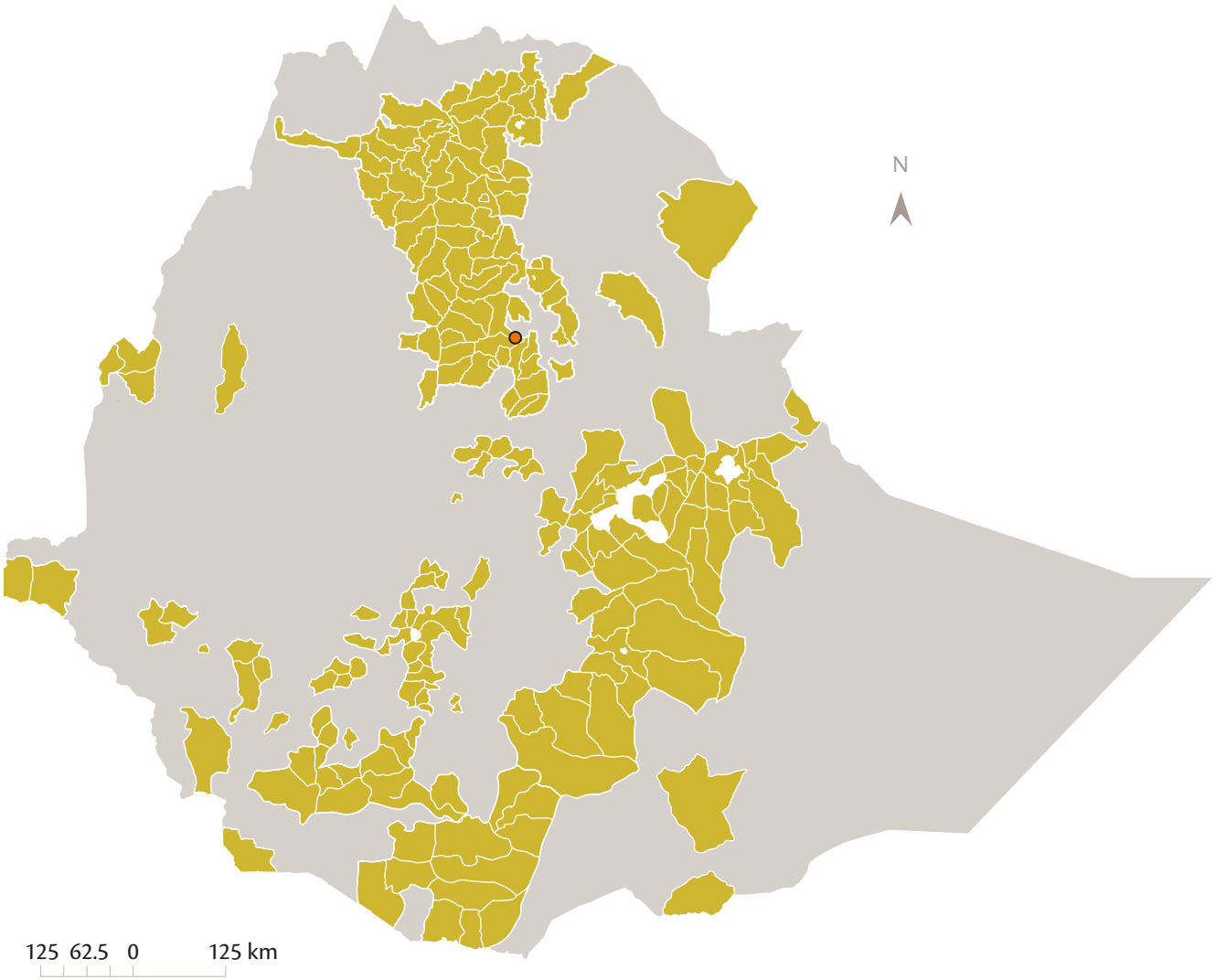
The SD and the wider Ethiopian Food System transformation process share several common features, focusing on food and nutrition security, multisectoral collaboration, food systems resilience, and environmental sustainability while aligning with national policies and strategies. Both aim to improve nutrition and food security by promoting nutrition-sensitive interventions, sustainable practices, and the availability of diverse, nutrient-rich foods.[181,182] The SD supports Ethiopia's food systems transformation by promoting sustainable and climate-smart agricultural practices to increase smallholder productivity, reduce post-harvest losses, and ensure long-term food production sustainability. It promotes the production of diverse, nutrient-rich foods to combat malnutrition, focusing on the dietary needs of women, children, and vulnerable groups. And it complements and strengthens Ethiopia's food system transformation efforts, through its actions to reduce child stunting and improve health and well-being.

Assessment of the innovation phase of the SD has demonstrated very promising early results: stunting was averted in 95,000 children under five years old in 2022 alone.[183] Further, just one year after the initial expansion of the SD into 240 Woredas (see Figure 6.1) , the programme successfully prevented about 60,000 cases of stunting and 2,900 cases of mortality.[184]

Existing interventions within the SD include climate-smart agriculture (implementing climate-resilient practices, nutrient-dense and bio-fortified crop production, and community-based seed multiplication), animal production, agroforestry, infrastructure development, WaSH (water, sanitation, and hygiene), supporting food processing and distribution, and the promotion of school feeding and better nutrition. Overall, the SD contributes to sustainable agriculture and improved nutrition outcomes by enhancing resilience and addressing malnutrition through integrated interventions across different agro-ecological zones in Ethiopia.[182,185]

Despite its success to date, the SD has been facing a number of challenges, notably relating to inadequate food-system resilience. The work set out in this chapter aims to address this. In particular, the approach adopted is structured around five dimensions of resilience as set out in Chapter 2, namely: agro-ecology-based production systems resilience, agri-value chain systems resilience, community based resilience, household-based resilience, and institutional resilience.

Figure 6.1: Seqota Declaration Woredas (Districts)



Source: Government of Ethiopia

6.2 Threats and challenges

Ethiopia faces a multitude of interconnected challenges and threats that significantly affect its stability and resilience to disasters. Maintaining access to safe, nutritious and sufficient food for all its people under such circumstances is a critical concern for the government. However, the stress placed on the country's food system is likely to be compounded by substantially increased food demand due to changes in the population and the economy. In particular, an increase in food availability will be required to meet the demands of the growing population which is projected to rise from around 130 million today, to nearly double by 2050.[186,187] Also, although people tend to spend a smaller proportion of their income on food as their income levels rise, demand for food per person increases. And as the economic status of the population rises, so demand for nutritional diversity in society is expected to increase, linked to a rise in demand for meat – and dairy-based foods.[188,189] These increased demands will combine with the front-line challenges and threats to the food system: both need to be considered by policy makers together. An analysis and understanding of these issues has revealed critical areas requiring focused interventions.

Other challenges to the food system include climate change, environmental stress, biodiversity loss, soil degradation, and water management issues, as well as national economic vulnerability. This portfolio of problems significantly affects the resilience of production systems, especially within the most vulnerable and food-insecure communities prioritised by the SD. Agri-food value chain systems in the SD also face other challenges, including extreme poverty, limited resource availability, rising living costs, internal conflicts, and climate-related factors. Together, these impact society both at community and individual level.

Particularly important threats and challenges impacting the effectiveness of the SD at all system levels are set out in the next section.[182,185,190]

6.2.1. Important threats to Ethiopia's food system

Climate change and drought: Acting through its food system, the social and economic impacts of climate change are hugely important.[191] Climate change (mainly drought) greatly affects the resilience of production systems across all farming systems, and impacts nearly all related sectors, notably: agriculture, water resources, and land resources (soil erosion and land degradation). Perhaps nowhere else is the change in weather and climate regimes more noticeable than in the water sector, which in turn, has major knock-on effects on the other sectors.[192,193] The effects manifest in the form of severe, frequent and prolonged drought, floods, and changes in the patterns of climatic variables. This has resulted in biodiversity losses and environmental degradation leading to reduction in crop productivity, scarcity in pasture and water, and threats to livelihoods. Put simply, the consequences can be catastrophic for smallholder farmers and vulnerable populations.

Over the past decade, Ethiopia has faced frequent and severe droughts, with significant episodes occurring almost every two years. This compares to once every ten years in the past.[194] Notable years for drought include 2011, 2015, 2017, 2020 and 2023 with the most recent severe drought taking place in 2021. The effects have been devastating on agriculture, water availability, and food security, impacting millions of people across the country.[195] In 2023, for instance, approximately 24 million people were living in drought-affected areas, with around 11 million estimated to be food insecure.[196]

The livestock sector has also suffered, with an estimated 6.85 million livestock deaths since late 2021. Regions most affected include Somali, Oromia and the Southern Nations, Nationalities, and Peoples' (SNNP) regions.[195,196] These droughts have led to critical water shortages, food insecurity, and malnutrition, particularly among children. The situation has been worsened by consecutive failed rainy seasons, as well as factors such as conflict and economic downturns. Humanitarian organisations are working to provide life-saving assistance, but there remains a high demand for urgent funding and resources.[196]

Environmental degradation: Deforestation exacerbates vulnerability to climate-related disasters. In contrast, increasing frequency and intensity of extreme weather events lead to floods and landslides which pose significant risks to the nation's stability and resilience.[191]

Internal conflicts and social unrest: Political instability and regional conflicts disrupt agricultural activities and access to markets, further complicating efforts to improve food security and economic stability.[197] Internal conflicts and unrest arising from political motives and implicit resource conflicts remain core factors that significantly affect and jeopardise production resilience in the SD intervention areas.[198]

Natural disasters and pandemics pose further significant risks to the SD by destabilising communities and affecting productivity, financial mobilisation, and support. These factors can also hinder the programmes implementation.

6.2.2. Important factors affecting the resilience of Ethiopia's Food System

The resilience of Ethiopia's food system to cope with the threats described in the previous section is affected by a great many factors. Severe limitations in terms of financial resources are particularly significant as these act to constrain the implementation of disaster preparedness programmes and reduce the scope for strengthening resilience. Other important factors are set out below.

High levels of poverty and reliance on rain-fed agriculture: heighten risks to food security due to all of the above mentioned threats, but particularly extreme weather events intensified by climate change.

Limited availability and lack of access to agricultural inputs: Shortage of improved seeds, fertilisers, poor mechanisation, and other inputs for the production of nutrient-dense and bio-fortified crops continue to constrain both production and the resilience of the agricultural system.[199] Although the types of such crops are limited, access to them is even more restricted. The situation is similar in the livestock sector. Limited availability and lack of access to capital, improved livestock breeds, forage seeds, feed processing, and other technological inputs have significantly impacted this subsector.[199,200] In SD areas, the feed shortage, including poultry feed, is particularly critical.

Limited access to improved agricultural technologies: this, combined with the widespread use of unimproved farming practices not only limit production and productivity, but also contribute to resource degradation and the vulnerability of food production.

Unsustainable resource use: Improper resource utilisation and farming techniques such as deforestation and using steep land for agriculture, contribute to resource degradation and have reduced the resilience of agro-ecology-based production systems.[201] While organic inputs can support sustainability and resource regeneration, the adoption and expansion of organic farming and sustainable land management practices face multiple barriers.[202,203] These challenges include recurrent droughts, erratic rainfall, limited farmland, insufficient organic material inputs (e.g. biomass and animal dung), and the labour-intensive nature of these practices. All of these factors make it difficult for smallholder farmers to implement improved practices.

Irrigation development and management challenges: Irrigation agriculture is substantially constrained by financial constraints that hinder investment in irrigation; technical and capacity gaps in modern irrigation and water management techniques as well as maintenance capacities. Externalities, including salinity, water resource depletion, inefficient use of water resources; and gaps in institutional and policy frameworks are all important.[204]

Poor animal health services and management practices: Existing management practices are mainly traditional, which reduces the efficiency of livestock growth-rate (important for meat animals) and/or the production rate (important for egg or milk-producing animals). Both of these impact efforts to improve nutrition by affecting the consumption of animal source foods (ASF) consumption, and by acting through impaired livelihoods.[205,206,207,208]

Limited WASH services: Ethiopia faces significant challenges regarding Water, Sanitation, and Hygiene (WASH) practices. In Ethiopia, approximately 60 million Ethiopians still lack access to safe drinking water.[209] Water contamination remains a critical challenge, exacerbated by insufficient sanitation infrastructure, leading to the spread of infectious diseases such as cholera and diarrhoea.[210]

Inefficient food marketing systems and chains: Ethiopia's food-marketing systems face several significant threats and challenges that impede their effectiveness and sustainability. These include market volatility, inadequate access to finance, and limited information on market trends.[211] Furthermore, the absence of quality control measures can undermine consumer confidence and the competitiveness of Ethiopian agricultural products in regional and international markets.[212]

Public health challenges: Poor healthcare infrastructure such as distance to health facilities, increases vulnerability to disease outbreaks and malnutrition, especially during post-disaster periods of both natural and man made hazards.

Infrastructure limitations: Inadequate transportation, communication, and sanitation hinder effective disaster response, particularly in rural areas.

Financial system exclusion: Financial exclusion is a critical challenge.[213,214] Many pregnant and lactating women (PLW) face substantial barriers in accessing financial resources – such as stringent collateral requirements imposed by banks. This often limits their ability to secure loans. Additionally, the lack of banking facilities in rural areas further isolates these women from essential financial services. Compounding this issue is low financial literacy, which hinders their capability to manage finances effectively and invest in healthcare and nutrition.

Socio cultural barriers: Social and cultural barriers are important.[215] Gender norms and cultural practices restrict women's roles, preventing them from participating in decision-making processes, in controlling household resources, and accessing vital social support networks.[216] Despite legal frameworks designed to promote gender equality in land ownership, traditional systems continue to favour men.[217] This restricts women's access to agricultural land, undermining their ability to cultivate food and generate income. As a result, both their food security and economic stability are compromised, impacting both the women concerned, and also their families.[37,218] This marginalisation limits their ability to advocate necessary services, and to influence community decisions. The result is to perpetuate inadequate support and to deepen gender – and other inequalities.

Poor Disaster Risk Management (DRM) mainstreaming; and challenges in the DRM Disaster Management Framework: The failure to incorporate DRM into various sectors prevents the integration of risk considerations into essential policies and strategies. This leads to poor preparedness and response in areas

such as urban planning, health, and the environment. The result is increased disaster vulnerability. Furthermore, the absence of DRM mainstreaming exacerbates challenges in the disaster management framework, such as inadequate data quality, poor inter-agency coordination, and limited funding. These issues hinder collaborative efforts and diminish response effectiveness. For these reasons, integrating DRM across all sectors is vital for enhancing disaster resilience and ensuring comprehensive preparedness and response.

Governance challenges: Food system and nutrition governance is a tailored process by which societies negotiate, implement, and evaluate collective priorities of food systems transformation while building a shared understanding of synergies and trade-offs among diverse sectors, scales, and stakeholders. The main challenges in the current governance mechanisms in food systems include lack of participation, transparency, and accountability.[219] Coordinated efforts across institutions and stakeholders are also crucial for long-term, multi-generational change.[220] The governance and coordination mechanisms of the Ethiopian food system and nutrition continue to face multiple challenges including:

i. Slow progress in the institutionalisation of the coordination mechanism: Evidence has shown that effective coordination is vital to achieve nutrition programme goals. For instance, Senegal has established a central nutrition coordination body under the Prime Minister that has helped the country to coordinate all stakeholders and interventions effectively and reduce stunting by more than 50% between 1994 and 2017.[221] In Ethiopia, however, the existing coordination mechanisms have not been successful in transitioning from the inter-ministerial steering committee to a legally binding Food System and Nutrition Council (FNC). This Council is intended to ensure proper coordination and accountability for Ethiopian Food Systems (EFS), Food and Nutrition Strategy (FNS) and SD at both national and sub-national level. However, at regional level, due to the federal governance system, almost all regions have currently established the Regional Food System and Nutrition Council by enacting a regulation which is binding, in terms of accountability and legal enforcement.

ii. Lack of inclusiveness: The existing food system and nutrition coordination mechanisms, as well as the planned FNC, have excluded civil societies and the private sector from the coordination platform. Evidence shows that strong engagement of the community and civil rights movement can be important – for example, it has helped Brazil to achieve its goal of reducing stunting.[222]

iii. Inadequate capacity: The absence of government financed human resource structures, leading to an inadequately trained workforce particularly at sub-national level, remains one of the barriers to strengthening effective food systems and nutrition coordination.

iv. External factors: Man-made and natural disasters and complex emergencies such as conflict, inflation, and climate induced drought and flooding have affected the food system and nutrition governance and coordination in diverse ways.[223] These emergencies shift government attention away from nutrition governance and coordination, and also influence the funding priorities of donors and development partners.

6.3 Resilience and its relation to the Seqota Declaration

6.3.1. Agroecology-based production systems resilience in the Seqota Declaration

Ethiopia's agricultural sector is crucial to its economy, employing over 70% of the population and making a significant contribution to GDP. The country produces a variety of staple crops. However, challenges such as climate change, land degradation, and pest infestations threaten food security.[224] Despite government efforts to modernise agriculture, improve productivity, and address malnutrition and food insecurity, access to sustainable, affordable healthy diets remains a critical issue, particularly in rural areas. This highlights the need for sustainable agricultural practices and resilience-building strategies.[224]

Ethiopian production systems are characterised by diverse agroecology-based approaches that leverage the country's varied agro-ecological zones.[225] These features facilitate the cultivation of diverse crops and livestock. The Ministry of Agriculture classifies these zones into 18 main agro-ecological areas, while other institutions recognise 33, based on temperature, moisture, altitude, and climate.[226] Approximately 16.4 million hectares of Ethiopia's total 112.3 million hectares are suitable for growing annual and perennial crops.[227]

The key principles of agroecology-based production system include diversification, recycling, and connecting producers and consumers – the goal is to create sustainable farming systems that strengthen the interplay between plants, animals, humans, and the environment for improved food security and nutrition.[228] Ethiopian farming systems are categorised into crop farming, pastoral and agro-pastoral, and mixed farming systems. Farmers in these different farming systems use different agroecology-based production methods that support sustainable agricultural production while preserving ecosystems.[225,229,230]This calls for tailored action – to engage farmers and local communities to help foster a resilient and sustainable agricultural system that supports food and nutrition security while preserving natural resources.[231] A particular feature of the SD, is that it emphasises the production and promotion of high-impact nutrient-dense crops and the employment of innovative approaches to address community needs across these different systems.

In crop farming systems, the majority of crop farming relies on rain-fed agriculture, with smallholder farmers accounting for about 90% of cropland and producing 95% of agricultural output. Key crops include cereals, pulses, and oilseeds, with cereals grown on 70% of cultivated land. Despite diverse crops, the dependence on rainfall leaves the system vulnerable to climate variability.[232,233] Resilience strategies include crop diversification, improved inputs, and irrigation. The SD specifically promotes nutrient-dense crops and bio-fortified seeds to enhance nutrition for vulnerable pregnant and lactating women (PLW).

The SD promotes high-impact nutrient-dense crops, such as bio-fortified varieties, to improve nutrition. Key resilience mechanisms in mixed farming include local climate-specific practices, resource recycling, and diversification, enhancing food security and ecological balance.[182,234] Bio-fortified crop production enhances the production of nutrient-enriched crops, such as iron, zinc, and Vitamin A-rich varieties. These help combat malnutrition and improve dietary diversity, contributing to stunting reduction in children under two. In SD intervention areas, 14,066,587 orange-fleshed sweet potato cuttings, 2,116 quintals of quality protein maize, and 3,755 quintals of iron-zinc rich beans were distributed and planted to support nutrition improvement during the years 2022-24.[235]

The SD programme incorporates climate-smart agricultural technique applications, as well as local community engagements in capacity building, and market linkages, promoting sustainable practices and economic opportunities for smallholder farmers.[235,236]

The livestock sector forms an important source of livelihoods in the country. Ethiopia is believed to have the largest livestock population in Africa and the fifth globally, with 66.3 million cattle, 38 million sheep, 45.7 million goats, and 41.4 million poultry.[237] Despite this, the supply of ASF consumption remains low compared to other African countries and global averages. For example, the per capita annual milk supply is 31.3 kg in Ethiopia compared to 87.9 kg in Kenya and 260.9 kg in Finland. The annual average per capita supply of meat in Ethiopia is 6.84 kg, 15.9 kg in Africa, 45.22 kg worldwide, and the annual per capita supply of eggs in Ethiopia is 0.42 kg, 2.84 kg in Africa, and 11.68 kg worldwide.[238] The SD also promotes ASF production and consumption through behaviour change, education and providing livestock such as milk goats, sheep, poultry and fish ponds to targeted households; the aim being to reduce stunting. By mid-2023, over 530,345 PLW (pregnant and lactating women) households benefited from sheep and goat provision, while 5.7 million poultry were distributed.

Pastoralism and agro-pastoralism farming systems are vital for those in arid and semi-arid regions, covering 61% of Ethiopia's land, and supporting over 12 million people who rely on livestock for their livelihoods.[239,240] The livestock sector contributes 20% to GDP, supplies 90% of live animal exports, and provides 80% of dairy production.[241] Mixed farming systems, combining crops and livestock, play a significant role in rural livelihoods, contributing nearly 70% of household income.

Irrigation in Ethiopia has a long history – initially used for subsistence farming and later modernised in the 1950s for commercial crops in the Rift Valley.[242,243,244,245] The country has significant irrigation potential, with 12 major river basins providing 122 billion cubic meters of surface water annually and substantial groundwater reserves.[242,246] However, only less than 13% of its estimated 5.3 million hectares of irrigation potential is currently used.[247,248,249]Irrigation systems offer benefits over rain-fed agriculture by enabling controlled water supply, improving crop yields and fertiliser efficiency.[250] Modern techniques such as drip and sprinkler irrigation reduce agrochemical losses and environmental impacts.[251] Against this background, the SD supports smallholder irrigation infrastructure to promote diversified crop and livestock production. Looking ahead, increases in investment and expansion of irrigation are crucial to enhance food and nutrition security, promote economic growth, increase resilience in Ethiopia's food system, and deliver the goals of the SD.

Effective natural resources management and soil health maintenance are crucial for sustainable agriculture. The SD addresses these through climate-smart interventions such as soil and water conservation, agroforestry, use of drought-resistant and early-maturing crops, improved agricultural practices such as intercropping and crop rotation, and the promotion of underutilised crops. Organic fertilisers, upstream watershed management to prevent erosion, and renewable energy sources for irrigation are also implemented. These efforts include environmental assessments, and support for vulnerable groups through social safety net programs.

6.3.2. Agri-food value chain resilience and the Seqota Declaration

The agri-food value chain is essential for the country's food security and economic stability. It covers aggregation, processing, distribution, marketing, and consumption. The entire chain is highly vulnerable to external shocks, such as climate change, economic fluctuations, and geopolitical tensions.[252,253] In view of these, building resilience across these segments is crucial to mitigate vulnerabilities and ensure stability in Ethiopia's agri-food value chain.[183,254]

Over the past decade, the Ethiopian agri-value chain has undergone significant changes. These include technological advancements in agriculture and supply chain innovations; changes relating to consumer behaviour and corporate markets; globalisation-induced social and economic shifts; increased emphasis on climate change adaptations; as well the development of policy and regulations relating to the environment and smallholder farmers.[255]

The SD Programme has led to improvements. However, there are further opportunities relating to market diversification, technology adoption, risk management strategies, and policy support – all of these remain critical for strengthening resilience. The Declaration outlines several activities to strengthen the nutrition-smart value chain and infrastructure. Key initiatives include providing financing facilities for actors in the perishable food value chain, particularly for women producers, and enhancing food market linkages and affordability. These efforts aim to: support financing facilities for medium- to large-scale groups or individual actors within the perishable food value chain; and promote better access to resources and growth opportunities. Despite efforts, these interventions have not been fully realised, making it difficult to determine if value chains are becoming more resilient.[256,257]

6.3.3. Household resilience with respect to the Seqota Declaration

Household and consumer resilience in Ethiopia is a complex issue shaped by various forms of capital resources, including human, financial, and social.[258,259] As the country grapples with economic instability, climate change, and food insecurity, understanding household resilience becomes crucial for promoting well-being and sustainable development. Human capital – comprising education, nutrition, and health – enables individuals to adapt effectively.[260]

Social capital, which includes community networks, plays a vital role in fostering resilience through enhanced information-sharing and mutual assistance, especially during crises. In rural areas, where agriculture is the primary livelihood, households often depend on both personal resources and communal support.[260]

Recent reviews have highlighted critical issues related to dietary diversity among PLW in Ethiopia.[261] Approximately one in three pregnant women (37%) and half of lactating women (50%) exhibited low dietary diversity scores (DDS). Alarmingly, over half of pregnant (57%) and lactating (50%) women demonstrated inadequate minimum dietary diversity (MDD).[262] Furthermore, 68% of pregnant women reported poor nutritional practices, with 80% consuming meals three times a day or less. The reliance on starchy foods is evident, with limited consumption of animal-sourced foods and fruit and vegetable intake falling below WHO recommendations.[262] Significant regional disparities exist, with the Amhara region showing the highest prevalence of low DDS (63%). Collectively, these issues expose vulnerabilities to micronutrient deficiencies, exacerbated by poor nutritional knowledge; nearly 74% of pregnant women lack awareness of essential food groups.[198,261]

Ethiopian households, including those in operation areas of SD, face numerous challenges that threaten their access to nutritious food and overall resilience. One significant issue is limited food availability.[263] Many struggle to find diverse, nutritious foods due to poor agricultural practices, climate change impacts, and inefficiencies in local markets.[263] Economic constraints further complicate the situation.[264] Limited financial resources restrict access to various nutritious foods, leading to inadequate dietary intake. This problem is often exacerbated by cultural practices that influence food choices, resulting in diets lacking essential nutrients.

Access to essential resources – land, finance, social support, human resources, and natural resources – is crucial for the well-being and resilience of PLW in Ethiopia.[265] These resources significantly affect their health, economic stability, and overall quality of life, particularly in rural areas where agriculture and community support are vital.

6.3.4. Community resilience with respect to the Seqota Declaration

The SD emphasises Ethiopia's commitment to enhancing food security, nutrition, and the welfare of PLW.[184] Achieving these goals hinges on understanding and strengthening community resilience, which reflects how effectively communities withstand and recover from challenges. Examining resilience within the SD framework reveals how communities adapt to adversity.

Community resilience in Ethiopia varies widely, shaped by factors such as social cohesion, resource availability, and infrastructure quality. Resilient communities benefit from strong social networks and active organisations, enabling swift resource mobilisation and effective crisis response. For example, engaged local groups can efficiently coordinate emergency support. Conversely, communities with weaker social ties face greater challenges during crises, often resulting in slower recovery and heightened vulnerability.[266]

Insights from both resilient and less resilient communities highlight the importance of robust social networks and infrastructure. Resilient areas manage crises effectively through resource-sharing mechanisms, while less resilient communities reveal the need for improved infrastructure and support systems. Although advancements like gender sensitisation and mobile banking have bolstered resilience, persistent challenges such as environmental degradation and inadequate infrastructure remain.[184,267] Integrating social capital, civil society efforts, and infrastructure improvements is essential for creating a resilient support system and ensuring the well-being of PLW.

To enhance community resilience, strengthening social capital is crucial. Developing digital platforms can improve connectivity among community members, while establishing community-led emergency response teams will ensure effective crisis management when challenges arise.

Advancing financial inclusion presents another significant opportunity. By innovating financial products such as low-interest microloans and tailored insurance schemes, underserved populations can gain better access to essential financial resources. Additionally, expanding mobile-based financial literacy programmes can enhance the skills of individuals in resource management.

Improving infrastructure is also essential for community well-being. Investing in smart healthcare solutions, for example telemedicine and mobile clinics, will extend healthcare access to remote areas. Upgrading transportation networks and water systems will further enhance the overall quality of life within these communities.

Finally, expanding educational and healthcare programmes can significantly improve access to critical services. Developing online education platforms and virtual healthcare services, paired with local partnerships for targeted training in health and nutrition, will empower communities and bolster their resilience against future challenges.

Overall, there are many interventions that have the potential to strengthen community resilience in general; in turn, these will enable those communities to be more resilient to disruptions affecting the food system. These include measures relating to preserving cultures, social behaviour change, engaging women in income generating activities, linking safety net beneficiaries for social services, revitalisation of growth monitoring and promotion services; and enhancing water, health and education infrastructures.

6.3.5. Institutional resilience with respect to the Seqota Declaration

Institutions and the coordination of governance

The Government of Ethiopia (GoE) has demonstrated a strong commitment to improving the nutritional status of its population, developing and implementing extensive policies and strategies that have played critical roles in the reduction of malnutrition and food insecurity over the last two decades.[268]

The following outline key developments which have involved department's across government.

The National Nutrition Strategy (NNS) was developed in 2008, followed by the National Nutrition Program (2008-2015). The subsequent programme, National Nutrition Program II (NNP II), was launched in 2016.[268,269] In 2015, Ethiopia launched the SD, to end stunting among children under two years by 2030 through integrated nutrition specific and nutrition sensitive interventions and multi-sectoral and multi-level coordination.

The SD is being executed in three phases over a 15-year period. The innovation phase (2016-2020) tested and evaluated interventions that were prioritised, as being innovative and proven high impact. The expansion phase (2021-2025) focuses on regions where stunting prevalence is high. Activities will be scaled up in the third phase (2026-2030) throughout the country. The SD is accelerating the implementation of NNP II and the National Food and Nutrition Strategy, and is being implemented by more than ten ministries including health, agriculture, education, water and irrigation, labour and social affairs and finance. The Food and Nutrition Policy (FNP) and the Food and Nutrition Strategy (FNS) which were endorsed in 2018 and 2021 emphasise multi-sectoral coordination and integrated interventions at all levels to deliver on the SD.[182,268,270]

To govern and coordinate the multi-sectoral coordination efforts and resource allocation, the GoE established governance platforms of the Nutrition Coordination Body (NCB) and Nutrition Technical Committee (NTC) during the NNP II. The NCB and NTC were chaired and co-chaired by MOH and MOA respectively. Since the launching of the SD, the government established an inter-ministerial steering committee chaired by His Excellency the Deputy Prime Minister who chaired the implementation of the SD Innovation and Expansion Phase. For the last three years, the MOH has established a Nutrition Coordination Lead Executive Office (NCO) to facilitate multisectoral coordination of the SD and the FNS. Furthermore, Ethiopia endorsed the Food System Transformation Roadmap in 2021 and expanded the mandate of the inter-ministerial steering committee in 2023 to coordinate the Ethiopian food system and nutrition programmes including the SD.[270]

Ethiopia's Ministry of Agriculture and Ministry of Health have been coordinating the various ministries which are involved in achieving the goals of the SD. Their joint efforts involve implementing high-impact, nutrition-direct and nutrition-indirect interventions, such as supporting sustainable farming practices, increasing dietary diversity, and improving maternal and child health care. Health Extension and Agriculture Extension programmes were among the frontline service providers at community level. These initiatives aim to address the underlying causes of stunting and ensure that children receive sufficient nutrition for optimal growth and development. Despite these collaborative efforts, several challenges persist, including limited implementation capacity, poor coordination at the national level, internal conflict, high staff turnover, lack of adequate funding, and competing priorities.[267]

The Ethiopian Food System (EFS) pathway follows in the footsteps of Ethiopia's Homegrown Economic Reform Agenda,

which aims to transform Ethiopia from largely agrarian low-income country to an industrialised lower-middle-income country by 2025.[181] Transforming Ethiopia's food systems and attaining Agenda 2030, especially relating to the second Sustainable Development Goal (SDG) ('Zero Hunger'), requires concerted and radical policy action. To achieve this, the Government has developed the Ethiopian Food Systems pathway around the five United Nations Food Systems Summit (UNFSS) Action Tracks, 14 action areas and 24 game changing solutions including the SD.[181]

Ethiopia's Productive Safety Net Programme (PSNP) was launched in 2005, aiming at reducing food insecurity by providing economic opportunities and building resilience to crises, through cash transfers, public works, and a nutritional feeding programme. The PSNP provides payments to able-bodied community members for participation in labour-intensive public works. It also offers direct payment support for six months to labour-poor, elderly, or incapacitated households, helping to stabilise their consumption, avoid asset depletion, and plan more effectively.[271] The PSNP focuses on community-based watershed development and asset creation, acting as a safety net for chronically food-insecure and poor households often affected by shocks.[272] The programme has evolved to PSNP5, which emphasises resilience building, system modernisation, and transparent, accountable structures. Currently, PSNP benefits over 9 million food-insecure individuals, focusing on cash transfers, disaster risk reduction, and linkage to social services.[272] PSNP should reconsider nutritional outcomes and SD innovations in the revision of programme objectives, so that the SD resilience activities can more easily achieve the 2030 target. Digital technology and social and behaviour change communication (SBCC) could improve the time and ease of PSNP transfer and address social factors to end malnutrition, respectively. The activities of both SD and PSNP need to be systematically coordinated with clear roles, responsibilities and accountabilities.

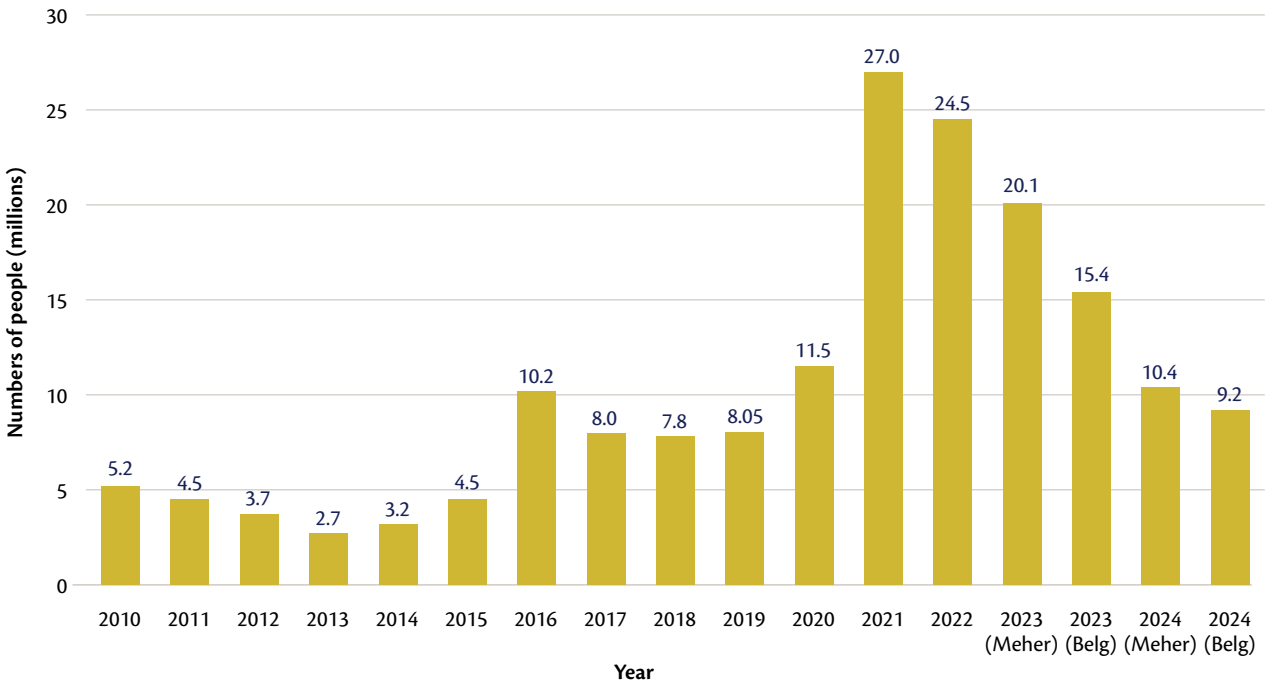
Disaster response and early warning

Ethiopia's vulnerability to natural disasters, especially droughts and floods, has caused significant loss of lives and livelihoods. Figure 6.2 illustrates the number of people needing emergency assistance since 2010. In 1975, the Relief and Rehabilitation Commission (RRC) was established laying the groundwork for organised disaster management and incorporating development efforts.[273] Political instability and conflict further exacerbated the country's vulnerability, by undermining response efforts and sustainable development.[274]

By the early 2000s, the Ethiopian Government recognised that a more integrated disaster risk management approach was necessary. This led to the 2004 National Policy on Disaster Prevention and Management, focusing on risk reduction and resilience-building. The establishment of the Ethiopian Disaster Risk Management Commission (EDRMC) in 2013 enhanced coordination among government agencies, NGOs, and international partners.[275]

The revised 2023 Disaster Risk Management Commission policy has significantly enhanced early warning systems and community-based preparedness initiatives to better anticipate and respond to disasters. Additionally, the government has invested in climate-resilient infrastructure, agricultural practices, and water management systems to mitigate the effects of recurring droughts and floods.

Figure 6.2: People needing emergency assistance, in millions from 2010-2024



Source: Ethiopian Disaster Risk Management Commission (EDRMC)

The Ethiopian Disaster Risk Management Commission (EDRMC) has established an early warning and disaster response system that integrates government, local communities, and international organisations, focusing on risk reduction and preparedness.[276] To tackle the increasing frequency of climate-related disasters, Ethiopia plans to implement a Roadmap for a Multi-Hazard, Impact-Based Early Warning and Early Action System (2023-2030). This initiative aims to enhance disaster resilience by linking early warning systems with preventive measures and risk reduction strategies. It emphasises collaboration among various ministries and partners, guided by the EDRMC.[274,277] The Roadmap encompasses four key elements: Risk Knowledge, Monitoring and Forecasting, Communication and Dissemination, and Preparedness and Response. By 2025, the EDRMC aims to develop a comprehensive database on hazards and vulnerabilities and enhance technology for monitoring by 2026. Effective communication strategies will be in place by 2027, ensuring timely warnings reach diverse audiences. The initiative promotes preparedness through contingency plans and local response teams by 2028 while aligning with the 2023 policy framework for integrated disaster risk management. Ultimately, it seeks to empower communities, enhancing their resilience against climate-induced challenges to protect lives and livelihoods.[277]

6.4 Resilience of the transformation of food systems

Building resilience in SD agro-ecological production systems, agri-value chains, community levels, household levels, and institutional levels, as described above, is essential. However, building resilience into the SD transformation process itself is also crucial. This requires integrated and coordinated efforts to overcome the many challenges faced.

The following outlines just some of the many factors that risk impeding – or even derailing – the transformation process which the SD aims to deliver:

Crises and disasters: As these arise and combine with other financial pressures, scarce resources allocated to transformation activities risk being diverted to other government priorities.

Conflicts: Any conflict which develops, spreads, or escalates, risks disrupting the transformation process and its ability to deliver its goals. Events in Ukraine demonstrate how even distant conflicts can cause substantial fall-out, for example by affecting supply chains, and the price of imported foods and agricultural inputs, such as energy and fertiliser.

Support from external sources failing to keep pace with changing conditions: An obvious example concerns international finance needed for adaptation to climate change. As international efforts to reduce greenhouse gas emissions continue to disappoint, so the likely projections for climate change worsen, and the future challenges to Africa's food systems increase.

Siloed thinking and policy inertia: These factors, together with a lack of capacity in both policy making and implementation, will tend to work against effective coordination – across sectors, government departments, and stakeholders involved in food system transformation. As explained elsewhere in this report, such coordination is essential for the transformation process to be effective, and its lack could compromise its resilience by constraining options for action, or by allowing actions by different parties to cut across each other.

Inadequate access to finance, insurance and other services for individuals and small businesses: This will particularly affect the resilience of smallholders, and also women involved in the food system, constraining their ability to invest in resilience.

Changes to the international policy and regulatory environment: exogenous factors such as these can add considerable challenge to both exporters and importers in particular, and disrupt the transformation of food systems as they struggle to adapt to a new regime. Obvious examples relate to finance, trade, and also research.

6.5 Ways forward

Strengthening the resilience of Ethiopia's food systems through the SD requires integrated and coordinated efforts. Although the challenges pose formidable hurdles, this project has also identified diverse opportunities to build and strengthen resilience of the Seqota implementation, and to strengthen the resilience of the country's food system more generally. These are set out below.[181]

The number and diversity of these opportunities are testament to the innovation and engagement of the many experts, officials and stakeholders that have come together in this project. However, to take these ideas forward into meaningful action, they need to be integrated into the existing SD strategy, and they need to be adequately resourced to achieve roll out at scale. There is clear high-level political will and cross government commitment to do the former – as evidenced through the engagement of the Ethiopian authorities throughout this project, and the many ministries and governmental bodies that are already involved in delivering the SD (see Section 6.3.5). However, it is infeasible for the Government, operating under severe financial constraints, to roll out these developments at scale by itself. Just as many of the threats to Ethiopia's supply of food and nutrition originate outside its borders, stakeholders beyond its borders need to support this effort. Chapter 8 provides specific proposals in this respect.

Opportunities to strengthen resilience have been identified as follows:

i. Agro-ecology-based climate and nutrition-smart approaches: Implement climate-smart practices such as improved drought resistant crops, nutrient-dense and biofortified crops, multipurpose agroforestry, improved livestock management, and organic soil fertility techniques to enhance

resilience to climate impacts and promote sustainable resource management. This may also include fostering sustainable production and ownership practices to improve food security and livelihoods.

As Ethiopia is endowed with ample land and water resources, increasing investment in small-scale irrigation with broader SD nutrition and development goals can play a vital role in improving food and nutrition security as well as reducing poverty.

ii. Enhance land access: Reform land ownership systems to ensure equitable access for women, particularly for landless PLW. Implement policies that secure land tenure and support women's agricultural activities, significantly improving their stability and resilience. Additionally, consider utilising non-fertile and agriculturally unproductive lands for urbanisation. Recent land tenure reforms and training initiatives in sustainable farming are vital for protecting women's land rights in Ethiopia. Promote economic development interventions targeting PLW and the poor to enhance food security and build resilience.

iii. Address financial challenges: It is essential to create tailored financial products, such as low-interest loans to invest in agriculture, and grants specifically for healthcare and nutrition. Expanding financial literacy programmes can educate women on budgeting and saving, empowering them to make informed financial decisions. Additionally, advancements in mobile banking technology can help overcome geographical barriers, making financial services more accessible.

iv. Humanitarian-Development-Peace Nexus: Strategies designed to align humanitarian support with development and peace-building efforts need to be operationalised. Ethiopia has developed an Implementation Roadmap and Operational Guide for Nutrition Centric HDP triple nexus, where the SD could benefit from its operationalisation.

v. Multisectoral coordination: Strengthen and sustain effective multisectoral coordination and governance for food systems resilience including the SD. Coordination and governance should be set up at the community level by involving community groups and non-state actors such as from the private sector. The community level coordination system should have a mechanism to evaluate the accountability, transparency and responsiveness of the coordination platforms at the Kebele and Woreda levels. Implementation of the Community Score Card is a good example to ensure an accountable and responsive governance system. Streamlining information sharing between government bodies and non-governmental organisations is crucial for enhancing response efficiency and preventing duplicative efforts.

Further examples of multisectoral coordination include:

- *Resilient communities benefit from strong social networks and active organisations, which enable swift resource mobilisation and effective crisis response.* Engaging local groups can efficiently coordinate emergency support. Conversely, communities with weaker social ties face greater challenges during crises, often resulting in slower recovery and heightened vulnerability.[266]
- *Integrating social capital, civil society efforts, and infrastructure improvements is essential for creating a resilient support system and ensuring the well-being of PLW.* Although advancements like gender sensitisation and mobile banking have bolstered resilience, persistent challenges such as environmental degradation and inadequate infrastructure remain.
- *Enhancing local capacities through expanded training initiatives for local leaders and volunteers in emergency preparedness and response strategies is vital.* This empowerment enables communities to take proactive roles during crises, while mentorship programmes connecting experienced practitioners with local leaders ensure the sustainability and enhancement of best practices in disaster risk management (DRM) and resilience-building. Furthermore, involving local populations in the development and implementation of an early warning system (EWS) will enhance the accuracy of alerts and foster greater community ownership over disaster management processes.

vi. Technology and infrastructure: Promote technology and infrastructure improvements such as socio-economic facilities, marketing facilities, road networks, and extension education to enhance agricultural resilience and productivity. Furthermore, harnessing advancements in mobile technology, geographic information system (GIS), and remote sensing can vastly improve surveillance and dissemination, providing timely and actionable information to communities at risk.

vii. Resource mobilisation, financial access and literacy: Broaden financial resources through private sector engagement and local multisectoral resource pools to support resilience building. Furthermore, innovative financing mechanisms such as public-private partnerships and social impact bonds and tailored financial products for financial literacy, are essential to ensure consistent funding.

Expanding financial services is also important to the resilience of the SD. Inclusive and innovative financial products need to be developed and tailored to PLW, such as low-interest loans and grants for healthcare and nutrition. Expanding and integrating mobile banking solutions will enhance access and stability for these women.

viii. Policy alignment and initiative support: Align SD implementation with initiatives like the Green Legacy, Yelemat Tirufat, and other new initiatives that promote agro-ecological sustainable practices.

ix. Health and food market information systems: Develop better market information systems to help farmers and traders make informed decisions. Improving Ethiopia's healthy food marketing systems is essential to help farmers make informed decisions and address the significant challenges they face. Recommended actions include implementing market stabilisation programmes, enhancing access to finance, strengthening market information systems for healthy diets, promoting cooperative structures, establishing quality control standards, facilitating training and capacity building for small scale business, fostering public-private partnerships, and enhancing infrastructure. By implementing these actions,

the healthy food marketing systems can be strengthened, making them more effective and sustainable while enhancing food security and economic growth.

To ensure the production of adequate nutrient-dense products, it is essential to strengthen health and agricultural extension systems. This can be achieved through comprehensive training, through a blended learning approach and involving community volunteer women's groups to promote dietary diversity and reduce malnutrition. Additionally, developing culturally sensitive educational materials and conducting community dialogues can raise awareness about the importance of healthy and sustainable diets.

x. Monitoring and Evaluation (M&E): Unified Nutrition Information System for Ethiopia (UNISE) is an existing data collection and management platform (functional from the lower-administrative to ministry level). This could be developed further, and applied to SD in particular. Further, documentation of best practices and lessons learned to facilitate replication and scaling of successful initiatives could usefully be produced. Incorporation of Artificial Intelligence could further enhance the M&E system of SD.

xi. Capacity building for disaster response: Enhance Ethiopia's SD resilience capacity through disaster risk management strategies and actions. This should be effected through support for the Disaster Risk Management Commission. This includes promoting climate-resilient agricultural technologies, WASH systems, early warning systems that incorporate community-specific indicators, food reserve systems, and other strategies to withstand future crises.

Furthermore, enhancing local capacities through expanded training initiatives for local leaders and volunteers in emergency preparedness and response strategies will enable communities to take proactive roles during crises. Matching these initiatives with effective engagement mechanisms is equally critical.

Investing in local data management and analysis capabilities allows for the integration of innovative methodologies, such as mobile surveys and community mapping, providing a comprehensive understanding of local risks and resource distributions for better decision-making and enhanced accountability.

xii. Strengthening and expanding implementation of nutrition interventions at the grassroots level: Consider deploying new special cadres to implement nutrition-specific and multi-sectoral nutrition activities, separate from – but coordinated with – existing health extension and other related programmes.

xiii. Conducting health education campaigns: Raise awareness about sustainable production, nutritional needs, and the significance of adequate dietary intake during pregnancy and lactation, empowering women to make informed choices. Additionally, continuous education of communities about disaster risks, preparedness measures, and response action plans is crucial to societal resilience against disasters.

An emerging issue is the rise in consumption of unhealthy diets, which has led to a nutritional crisis affecting Ethiopia as shown in recent EPHI studies. To address this, the newly developed Ethiopian food dietary guidelines should be implemented, food production and consumption patterns reformed, and community laboratory innovations leveraged to find local solutions. Promoting social accountability in the private sector by increasing nutrient-dense food processing and production, reducing ultra-processed food processing and distribution, and investing in nutrition and stunting reduction is also important.

Implementing gender sensitisation initiatives can challenge traditional norms that limit women's roles. Supportive government policies focused on women's empowerment, along with the efforts of community-based organisations, can provide the vital resources and support that women need.

Reflections: looking across the three country chapters

In focusing on the three contrasting countries – Sierra Leone, Malawi and Ethiopia – this project has drawn heavily on local expertise and perspectives to inform the work in each. There has been substantial cross fertilisation of ideas and perspectives between the three, supported by contributions from the three international experts on the Lead Expert Group. However the work of the countries remain distinct – reflecting their own approaches and perspectives, and very different local circumstances. It is beyond the scope of this report to provide a detailed analysis, looking across the three. However, the following general observations are worth noting.

1. **Each of the countries has sought to place possible measures to strengthen food-system resilience into the context of their existing flagship programmes. This has the advantage that those programmes generally enjoy support at the highest level of government, and involve different government departments. More generally, it is suggested that the wider perspectives in this project have helped to inform how the ambitions of their governments might be broadened further to bring for example, the demand side of food systems into sharper focus.**

2. **Each of the three countries has taken a view of which future threats and risks were of considered to be most important. However, the wide scope of this project has generally exposed a much broader range of risks that need to be considered. The message here, is the need for countries to expand and deepen their analysis of future risks, and especially how they might combine and interact.**

3. **In planning possible measures to strengthen resilience, the countries generally found the five dimensions of resilience helpful (see Chapter 2). It was generally emphasised that these were not independent of each other – the five needed to be considered together. An equally useful concept was the three forms of resilience (resist, recover and reorient). Together with the five dimensions, they provided a clear framework on which to 'hang' actions, and a means to identify where proposed actions were uneven in their coverage – for example by exposing a possible emphasis on recovery compared with anticipating and resisting threats and reorienting existing policies.**

4. **The need to roll out actions at scale, together with severe resource constraints was a recurring theme. Addressing the latter was seen as a considerable challenge with no easy solutions (see Chapter 8).**

5. **National/sub-national partnerships were seen as important, although the difficulties around these needed to be carefully considered.**

PART III

How to strengthen resilience – key messages for stakeholders

7 Key messages for African Governments

Key messages

This chapter draws on the three country chapters and brings together advice and recommendations relevant to African governments. Much greater priority needs to be given to strengthening the resilience of food systems across the continent. These systems are increasingly being challenged by diverse and converging threats – some of which, like climate change, are set to intensify in the decades ahead. But at the same time, they need to meet the rising demands of Africa's populations which are growing rapidly, and becoming wealthier. Looking ahead, many of Africa's food systems will increasingly struggle to function, and in the worst case, some may even risk collapse.

Strengthening the resilience of Africa's food systems is essential, else current efforts to transform them will be constantly impeded by successive crises. This transformation is vital to deliver universal access to diets that are sustainable, healthy, and affordable. Their absence is placing a brake on many policy agendas beyond addressing hunger and malnutrition – for example relating to equity, economic growth, health and the environment and the mental and physical development of children.

Despite these challenges, Africa has very significant strengths to draw on to realise its very substantial potential. It has growing youthful populations who can innovate and drive change. Here, new opportunities to strengthen resilience and create jobs are offered by the development and roll-out of innovative technologies such as digital and genomic tools to help provide producers with the means of transforming their food systems – to make them more resilient, so that they deliver sustainable, healthy diets for all. Such measures could contribute substantially to implementing the forthcoming Kampala Declaration (see Box 1). There is also considerable potential to increase the opportunities for women in African food systems. Too often they are disadvantaged over their male counterparts.

This report has identified major opportunities throughout food systems for strengthening resilience while also potentially benefiting the health of populations and the environment. Agro-ecological management practices are one example – these, together with digital technologies, are discussed more fully in view of their importance. Other opportunities include: strengthening multi-level governance and rethinking trade policy to better support their resilience; and promoting private sector investment in food systems transformation. These examples show that not all interventions require substantial government financial resources to take forward.

7.1 Top-level messages for African Governments

Food systems in Africa are coming under increasing pressure from multiple directions. What is clear is that based on current trends, many will struggle to function over the next 10-20 years. In the worst case, some may risk collapse.

First, they are under pressure from a 'cascade of crises'. Policy makers should expect this environment to continue into the foreseeable future, with some threats, such as climate change, set to intensify further. Other threats include the rising burden of indebtedness, conflict (local and distant), trade disruptions, pandemics, pests and diseases affecting crops and livestock, and environmental degradation.

Second, Africa's food systems need to evolve to meet the demands of its growing populations. These are projected to rise from just over 1.5 billion in 2024 to over 1.8 billion in 2035, and 2.5 billion by 2050.[61,62] These increases will add considerably to the pressures on food systems – not just from the greater numbers, but also from shifting diets as populations become wealthier. Increases in per-capita consumption of meat and other foods with relatively high environmental footprints are likely. At the same time, African food systems will also need to cope with a major expansion of its urban populations. These are projected to reach 1.2 billion by 2050 – an additional 600 million people.[65]

And third, African countries are increasingly constrained by mounting debt crises and many competing priorities. These will affect the ability of governments to act to strengthen the resilience of their food systems, and to transform them to deliver the goal of universal access to sustainable, healthy diets.

It is essential that governments look carefully at the resilience of their food systems and reappraise what needs to be done to make them fit for an increasingly uncertain future. The stability of food systems – and their capacity to provide affordable, sustainable, healthy diets – interacts with the health, well-being and productivity of societies, social stability, the robustness of governance systems, and the future of countries at every level. Food systems are also intimately connected to the natural environment and the environmental services which are essential to grow food – biodiversity, soil health, ecosystem health, are just some examples. For these reasons, the threats to food systems should not be viewed in isolation, but as a vital part of an interconnected socio-economic, political and environmental web.

Governments may inadvertently escalate the risks to their food systems by underestimating the scale and complexity of future threats that they face. If not carefully managed, such threats could combine, where each challenge amplifies the impacts of the others. Addressing this requires bold action to strengthen resilience, which will inevitably come with political and economic costs. However, governments must also recognise the far greater risks and long-term costs of inaction, including widespread food insecurity, economic instability, and diminished public trust. Proactive investment in resilient food systems is not just a cost, but a crucial safeguard for the future (see Box 7.2).

Measures to strengthen resilience need to be built into wider efforts to transform food systems. This is needed to

Box 7.1: Food transformation and the sustainable, healthy diets agenda

While there is considerable investment and ambition targeted at agricultural production and agro-processing across the continent, much of this remains disconnected from the sustainable, healthy diets agenda. For example, in Sierra Leone, much of the investment for Feed Salone is focused on rice while in Malawi, the focus of agricultural production is primarily on maize. A similar situation prevails in many other LMICs. This is an important missed opportunity. The outcome is that nutritious foods which contribute to a healthy diet are being produced at prices which are unaffordable for three billion people worldwide – including around one billion in Africa.[286] This needs to change. At the same time, the price of foods that are being consumed around the world do not properly embed the very considerable environmental cost of production, not just from greenhouse gases but also from environmental degradation.

Feed Salone, Ministry of Agriculture and Food Security

Box 7.2: The broad political context within which policy change in Africa will be implemented, is about to change.

During 2024 the AU developed a 'post-Malabo' agenda building on the Malabo Declaration (2014) and the Maputo Declaration (2003). This has drawn on the lessons of the 4th CAADP Biennial Review (2024) which concluded that the continent remains off-track to meet the Malabo Declaration goals by 2025. The review emphasised the need to accelerate the implementation of the African Continental Free Trade Area (AfCFTA) to accelerate intra-African trade in agricultural commodities.

With the Malabo Action Plan reaching its end in 2025, agreement has now been reached on a new roadmap which will outline plans for African food system transformation from 2026-35. This will also focus on climate resilience and adapting to unforeseen challenges like pandemics and extreme weather. This should be viewed as part of wider action to strengthen the resilience of food systems more generally.

In January 2025 the AU will adopt the Kampala Declaration which reflects an important new policy direction for the continent. Political leaders and policymakers in African countries will require guidance on how to implement the Kampala Declaration. It is hoped that the conclusions of this report, drawing on the realities of three African countries, will offer important and timely insights for low- and middle-income countries in Africa and beyond.

prevent transformation efforts from being constantly disrupted. It is now widely recognised that food systems need to urgently transform to deliver the goal of universal access to diets that are sustainable, healthy, affordable and accessible to all. However, the transition also has the potential to create substantial opportunities in terms of jobs and economic growth as well as many of the SDG goals.

The many commitments made at the 2021 UN Food System Summit, and at the UNFCCC, UNCBD and UNCCD COPs, including COP28 on climate change in 2023 provide evidence for political commitment to food-system transformation.[141] However, there continues to be substantial mismatch between the rhetoric, and the pace of transformation which remains inadequate in many countries.[141]

A major impediment to the transformation is the widening gap between what can reasonably be done by national governments to protect their food systems, and the global nature of the threats they must respond to. The latter threaten to constantly derail food-system transformation as political and economic resources are diverted to address other crises. Strengthening the resilience of food systems will not, by itself, address the limited progress in transformation, but it is essential to remove a substantial brake on progress.

Resilient food systems are essential for delivery of multiple longer-term development goals beyond hunger and nutrition. Today over three billion people worldwide, including over one billion in Africa, cannot afford healthy diets.

This lack of access can impair the physical and mental development of children: preventing them realising their educational potential, reducing their earnings through life, and entrenching them in poverty and disadvantage. It can also have profound effects on the health of populations – adding additional workload to healthcare systems already under stress; and reducing the productivity of workforces, and the growth of economies.[278] Taken together, failing food systems are one of the reasons why many countries across the world are failing to make progress towards reaching Sustainable Development Goals (SDGs) on hunger and nutrition, health and wellbeing, child development, inequality, jobs and growth, and climate change. On average, only 16% of the SDG targets are on track to be met globally by 2030, with the remaining 84% showing limited progress or a reversal of progress.[279]

7.2 Strengthening food-system resilience – key considerations

The measures taken by individual governments to strengthen the resilience of their food systems will depend on the specific combination of threats those systems face; and local circumstances – for example the scope of competing government priorities, and the vulnerability of their populations. This section provides guidance for policy makers as they evaluate their own situation.

Measures to strengthen resilience need to take a broad view: resisting threats as they develop, recovering after disturbances, and proactively reorienting to prevent problems from emerging. They should also consider five important dimensions of resilience. These broadly align with different classes of stakeholder who may need to act:

- **Production resilience based on agro-ecological conditions.** Agro-ecosystems with rich biodiversity, healthy soils, abundant water, and landscape heterogeneity typically fare better during shocks such as droughts and/or pest outbreaks; and they typically recover faster (see Section 7.3 below).

- **Value chain resilience based on economic characteristics and infrastructure.** This dimension relates to the value chain that links producers and consumers – it has both economic and infrastructural elements.

- **Consumer and household resilience based on livelihoods and assets.** Evidence drawn from livelihoods data show families who have substantial human and financial capital are both more robust as well as being better able to recover or reorient their livelihood to many kinds of shocks.

- **Community resilience based on social capital and civil engagement.** A substantial amount of food-system resilience is mobilised at a community level, for example, involving neighbours and community groups rallying during times of need to help each other. Communities with well-developed social and built infrastructure, functioning civil society organisations, lower crime rates, and access to services have better capacity to mobilise collective responses to challenges.

- **Institutional resilience based on governance and safety nets.** Formal institutions include governments, but also the development and donor communities. When problems extend beyond the scope of a household or community, or even a nation state, these institutions can mobilise proactive and reactive responses. Another key element of institutional resilience is the ability to anticipate threats and challenges on the horizon, and to plan for them.

This suggested approach will provide a practical framework on which to 'hang' actions, and a means to identify where proposed actions are uneven in their coverage (see Chapter 2 for a detailed explanation). Importantly it can also be used to consider how actions may interact and have secondary impacts on others – as well as trade-offs and unintended consequences.

Guidance for policy makers strengthening the resilience of their food systems

1. **A comprehensive understanding of the diverse threats that a food system could face in the future is an essential starting point.** This should include: planning for unexpected events, going beyond past experiences (notably due to changing climate), considering how some threats might have impacts which may seem beyond credible (e.g. COVID-19), and also how threats may interact and act in combination. The list of possible threats set out in Chapter 2 provides a starting point.

2. **The cost-effectiveness of different policies and actions need to be explored – and importantly, the risks and costs associated with inaction.** The aim is to find policies and actions that work under most possible future scenarios. Where possible, quantifying costs and benefits is likely to have stronger traction with decision makers. The cost of strengthening resilience might be one off, ongoing or associated with the overall efficiency of the food system. Social safety nets should be seen as a part of a resilient food system as they build up household resilience against crises. Evaluating benefits that go beyond food systems is also likely to be important – for example, those relating to health and healthcare costs; worker productivity; and addressing societal inequalities. These wider aspects may be particularly important to cross government engagement.

3. **It is essential to look right across food systems – from producer to consumer.** All parts of the system need to work together and be integrated with sectoral strategies (notably across water-energy-food). An effective way to ensure different parts of the food system are covered, is to map possible policies and actions onto the 'five dimensions of resilience' framework as described above.

4. **All relevant parts of government need to be persuaded and incentivised to play their part.** Direction and strategic oversight at the highest levels of government is essential to bring different interests together. Strengthening the resilience of food systems needs to be recognised both as a government-wide priority and embedded within other wider governmental priorities. Relevant departments need to appreciate how their own policy areas would benefit; and they need to be involved in developing and agreeing a cross-governmental strategy with clear actions and deliverables for each.

5. **Linking a cross-government strategy (to strengthen resilience) to government flagship programmes can help to leverage political and other resources.** However, it is important that those flagship programmes do not over-constrain any resilience strategy.

6. **Strengthening access to nutritious foods is important and needs to be explicitly addressed – food security with a focus on staples is important but not sufficient.** The ultimate goal should be universal access to sustainable, healthy diets, with diversification of food systems to include nutritious under-utilised crops.

7. **It is important to assure access to sustainable and affordable energy to power food-systems transformation.** Inadequate access to energy and power affects all segments along the food systems value chain, and is a major contributor for food-system inefficiencies.

8. **Individual policy choices need to be informed by the best available science and evidence.** And they need to be thought through, particularly to assess unintended consequences, and trade-offs.

9. **Developing pathways to build resilience into food systems needs to include processes to monitor progress and ensure accountability.** This is crucial to the development of more resilient food systems and engendering trust and confidence in decision makers.

10. **Consideration should be given to fostering multi-stakeholder collaboration.** This is essential and can help remove obstacles to building resilience.

7.3 Three broad approaches to boost food systems resilience

Over the course of this project three cross cutting themes were considered, each of which provide elements of important strategies to be woven into resilience planning. These are (1) alternative approaches to farm management based on the principles of **agroecology**; (2) the need to ensure changes are inclusive by addressing **youth and gender-related topics**;

and (3) the possibility that novel, and in particular **digital technology** may help boost resilience. This Section considers how these three cross-cutting topics can be incorporated into resilience planning and policy making.

7.3.1 New approaches to producing food based on the principles of agroecology

Agroecology provides a set of tools and principles that when properly applied may strengthen the resilience of food systems. It is an approach to farming which seeks to optimise interactions between plants, animals, humans and the environment. In particular, agroecological farms seek to engender socially equitable food systems within which people can exercise choice over what they eat and how and where it is produced.

Numerous groups have tried distilling agroecology into a series of principles. For example, Wezel et al.[281,280] suggest there are 13 principles of agroecology that include recycling, input reduction and soil health. The best known comes from FAO which proposes the '10 Elements of Agroecology framework' to assist countries in fostering transformative change (see Figure 7.1).[281] They are a useful analytical tool to facilitate decision-making by practitioners and other stakeholders when planning, implementing, managing, and evaluating agroecological transitions. The 10 describe essential components, key interactions, emergent properties and desired enabling conditions in agroecological transitions towards sustainable agriculture and food systems.

Each of these principles can usefully be supported by governments to help shore up the resilience of different parts of food systems. In particular, a commitment to reduce

Figure 7.1: 10 Elements of Agroecology framework

Source: Food and Agriculture Organization of the United Nations. Reproduced with permission

dependence on imports might help protect producers from the sorts of supply chain disruptions witnessed after Russia's invasion of Ukraine and the ensuing increase in fertiliser prices. Farm management practices that enhance crop diversity may increase the odds that farms will remain productive if some crops fail; while soils high in organic matter are better able to trap and store water and are therefore less drought prone. Policies can help promote these sort of farm management practices through educational programmes that might include hosting farmer field schools and funding farm extension officers to promote these practices. Financial incentives may be needed to help farmers switch inputs and experiment with new cropping patterns.

Of course, every region will be different and so any specific practices need to be situated within the context of local communities but overall, there is a consensus that carefully applied in locally relevant ways, the principles of agroecology can help 'boost farmers' income generation and stability by reducing losses to climate shocks and reducing inputs costs.'[282]

7.3.2 Ensuring everyone benefits: the gender and youth dimension in enhancing food-system resilience

In Africa, women and youth face persistent barriers to participation in agriculture, and food systems more generally. Despite the critical roles they play, they, along with other vulnerable groups, continue to encounter significant challenges, particularly in accessing land, education, and financial resources. This is a major, missed opportunity, both for them, and for African food systems. Addressing these barriers is essential to building resilient food systems that are inclusive and equitable, and in realising their considerable potential. Key priorities include the following.

- **Gender-transformative approaches are essential.** Strategies to promote food-system resilience need to adopt gender-transformative approaches that actively challenge and reshape gender norms which are both entrenched and negative. Empowering women by such means will lead to more inclusive food systems, enhance their participation in decision-making, and improve outcomes, in terms of food security, better nutrition, and resilience to shocks.

- **Youth engagement in agriculture must be strengthened.** Many young Africans are disengaged from agriculture due to limited resources, market access, and opportunities for leadership. Policymakers and stakeholders need to create pathways for youth empowerment – particularly through digital innovation, digital tools, skills development, and entrepreneurship.

- **Targeted measures are needed to close the digital divide.** While digital innovations – such as mobile platforms, precision agriculture, and digital financial services – have the potential to transform food systems, women and youth are less likely to access or benefit from these technologies due to systemic barriers.

- **Governments and stakeholders need to prioritise digital literacy initiatives alongside technological adoption.** Digital tools can revolutionise farming, but at present, low levels of digital literacy are preventing women and youth from benefitting fully. Widespread digital literacy programmes are essential to ensure no one is left behind.

- **Expanding access to credit, savings, and insurance products will boost efforts to build resilient food systems.** Currently, limited access to financial services, such as credit and insurance, hinders the adoption of modern agricultural technologies and limits resilience for smallholder farmers, especially women and youth.

- **Inclusive resilience strategies are needed to actively target marginalised groups.** Currently, resilience strategies in African food systems often fail to adequately address the specific needs of marginalised groups, with women and youth especially affected.

- **Social and cultural barriers that exclude women from decision-making need to be addressed.** Social and cultural norms continue to limit women's participation in decision-making processes.

Overall, there is a strong consensus that empowering women and engaging youth (which is hard to define) are crucial and often overlooked strategies that are necessary to any food systems resilience plan.[283,284] All of the strategies and recommendations discussed in this report, therefore, should be approached with a strong gender and youth lens. Before any programme or policy is enacted all plans should be scrutinised to ensure that traditionally marginalised groups have been engaged in the planning and implementation. This is one way of ensuring that those most often missed by development programmes receive the benefit of resilience policies.

7.3.3 The potential of novel and digital technologies to create more resilience

Work undertaken by this project has highlighted the considerable potential of new and novel technologies, and digital technologies in particular, in the drive to strengthen the resilience of food systems, and in transforming food systems more generally. However, to fully realise their potential, two things need to be in place. First, enabling policies need to create extension platforms, so that youth and women gain the benefit of technological innovation. Second, the use of technology cannot be imposed by external agencies but must respond locally to community needs. With that said, there are tremendous opportunities to utilise technologies to help increase the resilience of food systems. The following provide examples of the types of technological innovation participants in this project considered have particular potential:

- Tools linked with precision agriculture. Smart tractors, drones, and other related technologies can enhance the farmers' ability to boost yields while reducing potentially harmful inputs. Helping create opportunities for greater precision in input use will be particularly important for producers working in drought prone areas or areas with poor soil fertility.

- Distributed networked technology is now being applied to enable 'tractor swarms'. However, digital farm equipment need not be large scale nor capital intensive. Rather small scale networked machines – such as linked small scale cultivators – may be suited to small scale production systems and not require high levels of land consolidation or major economies of scale.

- E-commerce platforms can provide market data, access to supply chains, and, crucially, access to customers. E-platforms can also be used by small scale farmers to access technologies (e.g. by renting smart technologies such as tractor swarms on an as-needed basis) hence showing the potential for digital tools to work in smaller-scale farming systems.

- E-finance platforms can be linked to e-commerce platforms to help smallholder farmers develop credit histories that can then be used as the basis of micro- and small-scale loans and investment programmes, removing the likelihood that small scale producers find themselves in exploitative relationships with informal lenders who loan capital on usurious terms. Such processes can also help smallholder farmers access markets and overcome supply chain hurdles.

- A potential application of digital technologies is that they offer the opportunity to link local weather forecasting with farm insurance programmes thus increasing the likelihood that farmers will receive advance notice of climate shocks in time to adapt (for example by moving livestock or stockpiling fodder), as well as reducing the time it takes for aid to reach producers. Veterinary services offered through a tele-health model is another possibility. A combination of AI and video calls are increasingly creating opportunities for remote producers to access veterinary services that can then, ideally, be linked to e-commerce platforms to order and deliver livestock treatments.

At present, many aid agencies, donors and national governments are investing in digital platforms that address many of the topics just listed. For instance, the 'plant village' Nuru app helps diagnose plant pathogens and provides treatment advice to producers.[279] However, while these applications, and many others, are often discussed as the ways in which 'the digital agricultural revolution' may help smallholder producers, many very serious barriers remain. For one, rural broadband and basic connectivity are issues in rural parts of many LMICs. Furthermore a recent survey of farmers in West Africa suggests that access to the hardware (e.g. smartphones, tablets, etc.) is extremely limited and for many farmers the highest type of technology they currently have access to are radios and televisions.[285] Finally, for millions of farmers who only have access to the smallest plots of land, there seems to be no technological or management pathway (be it agroecology, digital agriculture or a hybrid that uses elements of all of the above) that meaningfully reduces poverty. For farmers dependent on the smallest of landholding sizes, the only meaningful strategy out of poverty involved pathways out of agriculture. For far too many people today, this involves unsafe migration and the attendant risks and vulnerabilities that strategy entails.[46] Consequently, if digital technologies are going to have a positive impact on the resilience of food systems, the following are important.

First, the rollout of such technologies needs to take place at scale, while ensuring accessibility for those that need them. Small-scale pilots have their place, but for the effects to be transformative, widespread roll-out is essential. Second, the roll-out needs to be accompanied by equally widespread capacity building in farmers, and other potential users, so that they can use it effectively. Here limited literacy skill in some parts of Africa will be an issue, although the development of intuitive interfaces may help. Third, these technologies should be seen as supporting the principles of agroecology in that these tools may help enable greater soil health and reduced inputs. Finally, the development and application of these tools must be grounded in the local context of smallholder farmers in LMICs and focus on engaging women and youth.

8 Key messages for other stakeholders

Key messages

While African governments, such as in Ethiopia, Malawi and Sierra Leone, are acting decisively to strengthen their food systems, it is infeasible for them to fully address the diversity and scale of future threats alone. This is in large part because of severe resource constraints amidst a growing debt crisis. Assistance is needed from other stakeholders working together with governments: the donor community, the private sector, international organisations, the research community and civil society. Key priorities are set out in this chapter.

By focusing on strengthening the resilience of food systems, the policies and investments of these stakeholders have the potential to accelerate progress on diverse policy agendas in the three countries – beyond addressing hunger and malnutrition. More resilient food systems will engender populations who are healthier and better protected from the impacts of climate change. Children will be more able to attain their full physical and mental potential. There will be a positive effect on workforce productivity, and economies will be better positioned for growth.

8.1 Key recommendations for donors

The donor community already does much to support African countries as they endeavour to both feed and nourish their populations, particularly at times of crisis. Yet the stark reality of widespread malnutrition and food insecurity remains, and in some areas has considerably worsened in recent years. In Sierra Leone for example, in 2024 82% of the population were food insecure, up from 74% in 2021. Urgent action is needed if the food systems across the continent are not to deteriorate even further in the future. This is in view of the diverse threats relating to climate change, the environment, conflict, human pandemics, pests and diseases, and debt crises. Added to these are the increasing pressures on food systems which will arise from population growth across the continent.

Together, the recommendations set out below argue for members of the donor community to rethink their support for food systems in African LMICs, and focus on strengthening their resilience and the resilience of the food system transformation process. These recommendations flow from the work conducted in the three countries (Chapters 4-6). The many local experts and officials involved in leading and undertaking that work, means that the following are firmly grounded in local realities and complexities:

- **Donors should consider allocating a major increase in resources to strengthen food-system resilience, and to roll out programmes at scale.** At present, in country partners Malawi and Sierra Leone, there are too many small projects that fail to have sufficient aggregate impact to create the rapid and widespread change that is needed. There are two key arguments for a substantial increase in support. The first concerns the severity of future threats to food systems, the danger of future collapse, and the widespread implications which flow from that. Second, resources spent on strengthening food-system resilience will have extremely high leverage. As already explained, universal access to sustainable, healthy, and affordable diets is an essential foundation for delivering multiple policy agendas beyond addressing hunger and malnutrition. Resources spent on food-system resilience will also help to protect and potentially strengthen existing efforts to transform food systems from being constantly impeded or derailed as crises emerge.

- **There is a strong case for much better coordination and cooperation between donors.** Stakeholders and experts in Sierra Leone and Malawi were clear that there are too many projects on agriculture, nutrition and food systems that are piecemeal and overlapping. Country partners were clear that better coordination and cooperation would also engender the major mobilisation advocated in the previous point.

- **Donor support to transform food systems and make them more resilient needs to place more emphasis on the longer-term.** This point is not to discourage shorter-term projects. However, transforming food systems is a long-term challenge, and needs to take an equally long-term view of threats and risks to food systems. The view from the three country partners is that donors need to give more attention to the longer-term.

- **The balance between donor support for vulnerable populations at times of crisis (e.g. through social safety nets), versus support to make food systems more resilient, needs to be carefully considered.** Both have their place. However, achieving greater resilience would engender self-reliance, and better access to sustainable, healthy diets for all in the longer term.

8.2 Key recommendations relating to the private sector

Private businesses dominate all food systems and therefore need to be at the heart of any strategy to strengthen food-system resilience. While businesses in the sector do a great deal to keep food systems delivering, there is, nevertheless, a marked disconnect between some of their commercial priorities and those of governments. For example, the current increases in the production, marketing and consumption of ultra-processed foods in Africa do not align well with growing public health concerns about increases in obesity, diabetes and cardiovascular disease across the continent, and the attendant costs for public healthcare systems.

The relative power that major corporations are able to exert is far greater than the micro, small and medium enterprises (MSMEs) that fuel much economic development on the ground. However, micro, small and (lower-tier) medium enterprises transact about 85 percent of the volume of activity of Africa's agri-food private sector; compared with 15 percent transacted by (upper-tier) medium/mid-sized and large enterprises.[287] This asymmetrical situation has led to concerns that corporate concentration has created additional vulnerabilities within food systems, and prime many of them to fail in the event of shocks originating from outside their territory.[288] Nevertheless, both sides – governments and the private sector – have a common interest in engendering food systems that are resilient to the evolving threats and challenges that they are facing.

Governments and businesses need to work together without delay to develop joint strategies to strengthen the resilience of food systems. This needs to be a priority and will add considerable value to the benefit of both. Such strategies should consider the following:

- **Ensuring that a stable policy and regulatory environment is in place that supports micro-, small- and medium-enterprises (MSMEs) along food value chains, as well as physical security and security in land tenure:** all are important factors influencing investment decisions at both large and small scales.

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- **Priorities should be agreed for research and capacity building that promote the development and roll out of new and novel technologies.** These should include increasing the capacity of smallholders and MSMEs to access and utilise new innovations.

- **Regulation should be considered as a possible stimulus for change – for example by creating a level playing field for smaller businesses to operate.** Individual firms, and particularly MSMEs, may be reluctant to be 'first movers', where that might involve additional costs and investments which their competitors would not incur.

- **Government policies and incentives should be considered to 'nudge' or encourage companies to strengthen resilience in ways that have societal, as well as commercial benefits.** The complexity of food systems means that businesses may have many options to act to strengthen resilience – involving different winners and losers, and different implications for society (as opposed to profits).

- **The informal food sector needs to be encouraged and better supported.** Both have critical roles to play in supporting food security, in improving access to dietary diversity, particularly in times of crisis.

8.3 Key recommendations for the international community

8.3.1 Climate-related finance and policy

Agreement was reached at COP29 for the New Collective Quantified Goal on Climate Finance (NCQG). This aims to increase annual international support for developing countries from US$100 billion to US$300 billion by 2035. It also exhorts all actors to work together to scale up climate finance to developing countries, from public and private sources, to US$1.3 trillion per year by 2035. This is to be welcomed, but with the following caveat.

Despite the progress at Baku, there remain substantial areas of concern. The IPCC has previously estimated that globally, developing countries will need US$127 billion per year by 2030 and US$295 billion per year by 2050 specifically to adapt to climate change.[289] In 2022, developed countries provided and mobilised a total of US$ 115.9 billion in climate finance for developing countries, exceeding the previous annual US$100 billion goal for the first time. This achievement occurred two years later than the original 2020 target year.[290]

††† UN Framework Convention on Climate Change (UNFCCC); UN Convention on Biological Diversity (UNCBD); UN Convention to Combat Desertification (UNCCD).

On the face of it, these figures seem to compare favourably with the Baku NCQG, and in particular with the agreed US$300 billion per year by 2035 – assuming that the full amount is provided. However, the NCQG funding also covers other actions besides adaptation: for example relating to climate change mitigation (e.g. the transition to clean energy) and funds to rebuild damage resulting from climate change impacts. Furthermore, identifying and planning new adaptation measures, and rolling out existing measures at scale needs to proceed urgently as the effects of climate change continue to intensify, all the while. This argues the need for any increased funding to be made available quickly and efficiently. Also, any funds provided as loans, rather than grants, will only exacerbate the current debt crisis faced by many LMICs.

It is essential that the food systems, their transformation, and their adaptation to climate change, are given high priority in the allocation of funds. This is consistent with the widespread recognition of the critical importance of food systems to multiple policy agendas beyond food and nutrition. Also, adaptation measures are particularly needed by LMICs – as they are disproportionately affected by climate change, and are least able to resource adaptation.

The new focus on food systems at UNFCCC, UNCBD and UNCCD COPs[†††] is to be welcomed, as are the many commitments to transform food systems made by nations at these different international fora – as well as at the 2021 UN Food Systems Summit. Such a transformation is essential for: enabling vulnerable populations to be resilient to climate change; for food systems to become more sustainable; and in delivering universal access to healthy diets that are essential for health, wellbeing and the future prosperity of individuals and countries.

8.3.2 Trade

International trade policy needs to be re-thought, so it can better support the resilience of food systems – not just in Africa, but globally. Trade has a critical role to play in strengthening the resilience of food systems, and in keeping vulnerable populations fed at times of crisis. Yet at times of geopolitical uncertainty, an over reliance on imports creates vulnerabilities, partly because trade mechanisms are not designed for these goals.

Strategies, such as the African Union's Malabo Declaration on Accelerated Agricultural Growth (and its successor, the Kampala Declaration) and the Africa Continental Free Trade Agreement (AfCTA) should be better facilitated. The trade balance of the three countries considered in this report (and others in Africa) are negative, thereby acting to increase their indebtedness. Trade in manufactured goods, especially food products, between and among African countries should be better supported – for far too long African countries have principally traded in raw materials. New national agro-industrial policies that are synchronised with regional and global trade policies should be encouraged. Overall, the pursuit of agro-industrialisation addresses multiple challenges to building climate resilience in food systems transformations, from production to consumption.

Encouraging and supporting trade at a local level is also important. Recent evidence shows that markets and access to markets is an important factor in promoting dietary diversity (more important than own production). Such diets engender resilience in both families and communities.[291]

8.3.3 Relations with other countries and power blocks

Dialogue between African Countries and the European Union (EU) should be developed further, to discuss how EU policies link with the resilience of food systems in Africa. African countries continue to develop important relationships with countries around the world. Some of these involve areas of policy which intersect with the interests of food systems. Examples include trade, investment, cooperation and research. These relationships may offer opportunities, but also risks, for example if partner countries change their regulatory policies in the future. By way of example, an assessment of how EU policies may affect the resilience of food systems in Africa was commissioned for this project. The following provides an outline of some of its findings.

Food systems in Africa and Europe are closely intertwined. Europe is a major importer of African food commodities and is a substantial supporter of food agencies and scientific collaboration in Africa. However, European greenhouse gas emissions are a substantial contributor to climate change, with African countries being especially impacted.

EU policies have long impacted African food systems – notably through the Common Agricultural Policy (CAP). More recently, the 'Green Deal' and other 'greening' policies are also expected to have an impact in Africa. They include regulation on deforestation, the Corporate Sustainability Due Diligence Directive, the Carbon Border Adjustment Mechanism (CBAM) and the imposition of stringent standards.

The EU has a strong interest in ensuring that African food systems are resilient – not only in view of its present trade with Africa, but also because of its humanitarian policies, as well as wider implications for politically sensitive areas of policy, which have implications for economic and political stability.

Dialogue between African countries and the EU on food systems should consider the following objectives:

- **Develop a better understanding of the possible negative and positive effects of EU policy development on the food systems of vulnerable countries.** The aim would be to inform the design of new policies.
- **Use the debate about those policies as a vehicle to include more voices from vulnerable countries and populations.** A specific goal should be to access knowledge and understanding of local circumstances to evaluate the possible impacts of policies on vulnerable populations.

- **Ensure that the EU's pollution and environmental footprint is not externalised at Africa's expense.**
- **Foster support for research and innovation specific to food systems in African countries.**

In addition, The African Union Commission could usefully support African member states to estimate national carbon stocks with a view to negotiating fair carbon trade with European countries. African countries could use their carbon stocks as collateral for loans related to 'green food systems projects'.

8.4 Key recommendations for the research community

Strengthening resilience in food systems transformation is constrained by multifaceted problems. This shows that a holistic and integrated research approach is required, aimed at finding sustainable solutions.

Suggested research priorities are as follows:

- Researchers should adopt a gender, youth and social inclusion approach and engage with groups concerned with promoting equity. The aim would be to proactively explore how policies to build resilient food systems can help address inequitable effects of the distribution and access to healthy diets; and inequity in the participation of groups such as women and youth in food systems.
- Researchers should be encouraged to engage in participatory and community-based research to co-develop locally relevant resilience programming.
- Researchers need to develop a better understanding of how regenerative climate smart agricultural practices can be incentivised among smallholder farmers.
- There is a need to develop a better understanding of how novel technologies can be applied in ways that enhance resilience at the agro-ecological level.
- Food systems governance-related issues need to be a focus of research. Consideration needs to be given to multi-stakeholder networks and communication channels – the aim would be to provide guidance on building inclusion and agency for local voices (farmer groups, extension staff, and market trader associations). The goal is to ensure targeted resilience planning across a country.
- A research priority needs to address the use of trade agreements and regulation (global and regional) as a means to strengthen the resilience of food systems, and to ensure secure access to sustainable healthy diets, and the foods that are essential for those.
- The development of novel and digital technologies should be a priority, linked to plans to roll them out at scale (see Section 7.3.3).

However, research is not enough in itself. Many technologies for addressing most of the binding constraints to strengthening resilience are already known and available. Nevertheless, problems concerning who can access these technologies and intellectual property rights remain. These challenges are not only widening the gap between the technologically advanced countries and Africa, but are also limiting growth and resilience of the African food systems. Innovative policies and technology access policies are required.

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