1

Fixing Our Broken Food System

The Why and How

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Highlights

- Our food systems have performed well in the past, but they are failing us in the face of climate change and other challenges.
- There is a broad consensus that transformation of food systems is required to make them sustainable and equitable for all.
- Transformation occurs via agents of change: individual behaviour, policies and institutions, research and innovation, and partnerships and alliances.
- Outcome-oriented agricultural research for development can help bring about directed transformation that maximises benefits and minimises trade-offs.

1.1 Introduction

More than twenty reports published in recent years and involving hundreds of scientists converge around a simple message: globally, food systems require radical change (EAT-Lancet, 2019; GLOPAN, 2020; HLPE, 2020; Pharo et al., 2019; Steiner et al., 2020). In 2021, the United Nations Secretary General convened the first of its kind Food Systems Summit towards this goal. The transformation of food systems can address sustainability and development challenges from local to global scales by moving these systems into more sustainable trajectories while at the same time empowering societies to address chronic undernutrition, overnutrition, and disease. By 2021, climate change had become a systemic driver of fundamental reorganisation of food systems while also acting as a risk-multiplier for the vulnerable.

The COVID-19 pandemic has starkly revealed the lack of resilience of our food systems to unexpected shocks, and the poorest and most vulnerable in society are worst impacted (Carducci et al., 2021). There is an urgent need – and a unique

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opportunity – for food-system transformation that 'builds back better' by mitigating vulnerability to shocks while delivering nutritional, environmental, social, and political–economic benefits. The pandemic has brought the lived experience of transformational societal shifts to the forefront of global discourse and unlocked unprecedented financial support for systemic transformation (Barrett et al., 2021). Nevertheless, food-system transformation will differ from the crisis management that has characterised much of the global response to COVID-19 by being far longer-lasting, enshrining environmental sustainability, and ensuring that nobody is left behind.

Food-system transformation that achieves many interwoven goals is likely to be complex, disruptive, and expensive, and some people may face risks. Inaction will result in far worse and more expensive outcomes for society and planetary health, however. Transdisciplinary approaches and highly focused research can help achieve the goals of sustainable and equitable food systems in the face of climate change and other global drivers of change, while identifying and minimising risks and trade-offs.

1.2 What Are Food Systems, and What Is Wrong with Them?

Food systems comprise all activities, institutions, and actors engaged in agricultural and food-related value and supply chains. They encompass production and the provision of associated inputs, consumption, food losses, waste management, policy and fiscal environments, and environmental and socio-economic drivers that bring about change and can create feedbacks (Figure 1.1). Food system outcomes contribute to human nutrition and health and to environmental and social welfare and thus can advance the Sustainable Development Goals.

Over the last 70 years, the global food system has provided adequate food for the human population to triple, and for much of this period, real food prices have been constant or declining. Overall, the prevalence of hunger and undernutrition has lessened, although substantial regional differences persist. In many parts of the world, increasingly unreliable weather and more frequent extreme weather events are changing the patterns of food production, with significant shortfalls in some places. Hunger still affects hundreds of millions of people – 768 million in 2020 – and another 2.37 billion lack access to adequate food and healthy, sustainable diets (FAO, 2021; Willett et al., 2019). Yet heightened food production comes with unsustainable environmental costs – natural resource degradation, disrupted nutrient cycling, and losses of biodiversity and ecosystem services (IPBES, 2019). In many lower- and middle-income countries with heavily agriculture-based

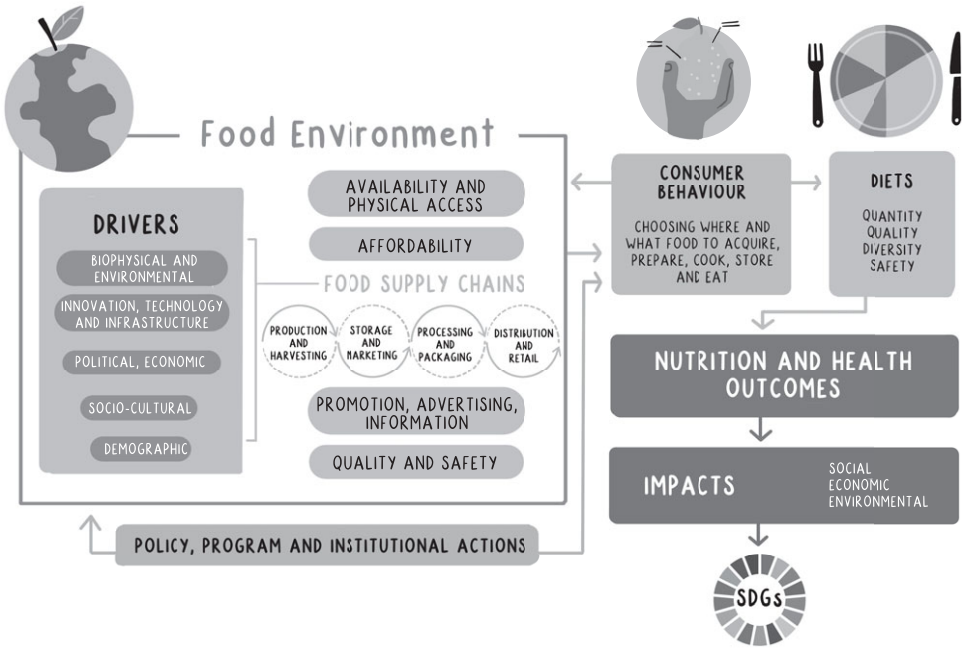

Figure 1.1 The food system.
Adapted from The Impact of COVID-19 on Food Security and Nutrition by the UN Executive Office of the Secretary-General, ©2020 United Nations. Reprinted with the permission of the United Nations

economies, a lack of employment and decent work in agriculture and rural communities is a factor driving rural-to-urban migration.

The risks to agricultural productivity are increasing, including climate-related shocks due in part to greenhouse gas (GHG) emissions from food systems (Cottrell et al., 2019; Masson-Delmotte et al., 2018; Springmann et al., 2016). From farm to fork, globally, these amount to 18 billion tonnes of carbon dioxide equivalents per year, representing 34 percent of the total anthropogenic GHG emissions (Crippa et al., 2021). Current pledges by national governments to reduce GHG emissions are insufficient for the planet to stay within a safe operating space of 1.5°C or even 2.0°C warming. The current trajectory as of 2021 is towards 2.6°C or 2.7°C of warming by 2100. We need a giant leap in global ambition to cut emissions.

At the same time, recognition is growing of the ways in which climate risks may affect food systems, human conflict, migration, health, and security, often in combination and across sectors and borders (Challinor & Benton, 2021). There are, however, other drivers of change in food systems besides climate (Figure 1.1). The

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biophysical dimensions of climate interact with the biological bases of agricultural productivity, and simultaneously, a wide array of socio-economic factors shape agriculture through on-farm management and policies. These interactions are strongly non-linear, giving rise to complex feedback relationships that impact food systems and their behaviour in response to change. Strengthening the ability of food systems to adapt to drivers of change is at the heart of the case for food-system transformation, along with the need to improve the sustainability and equitability of food systems and ameliorate the underlying limitations and justice issues in patterns of resource consumption.

1.3 What Is Transformation, and How Does It Happen?

In view of the complexities of food systems and the multidimensional risks they face, incremental innovation will be insufficient to address the challenges ahead; transformational change will be needed. 'Transformation' means a redistribution of inputs and outputs towards sustainable, inclusive, healthy, and climate-resilient food systems (Vermeulen et al., 2018). It thus entails, for example, significant changes in the structure of landholdings, in technologies and their uses, in the capabilities of and opportunities for women and men, in the flow of public and private finance, and in the distribution and dynamics of the population and labour force (Steiner et al., 2020). The many examples of transformations in human history have usually been undirected and intensely disruptive, with winners and losers emerging through time (Herrero et al., 2020). Better-directed transformation can empower women and youths while generating multiple crucial benefits such as improving education, nutrition, health, water access, sanitation, and incomes for small-scale agricultural producers including those engaged in fishing, pastoralists, and agri-foresters.

Transformation will inevitably generate trade-offs as well as benefits. Navigating food-system transformation requires an evidence base to enable the desired outcomes to emerge and may entail the provision of safety nets for those who lose out through potentially massive redistributions of land, labour, and capital. In addition, no transformation happens in a vacuum: transformations in other sectors such as in energy and information technology are already having huge impacts on food systems. By the same token, food-system transformation can cascade into improvements in many other aspects of society.

Transformative change may be driven by multiple 'agents of change' operating at different levels and dimensions of societal and economic systems and at various points throughout the food system. A shift in one component can trigger knock-on changes on other parts of the system, such as feedforward or feedback changes,

either as a slow ripple effect or as a rapid tsunami. While transformation can be viewed through many lenses, in general there are four types of agents of change (Wilber, 2001):

Individuals and Behavioural Change: The behaviour of individuals is shaped by personal and collective values and worldviews and influenced by innovation and policy. Individual behaviour is aggregated through different social institutions, including households, communities, workplaces, and civil society. Understanding how individuals can be effective agents of change requires considering the various roles that they play within food systems as consumers, farmers, processors, retailers, and regulators (see Chapter 9 about how individual behaviour can drive change towards healthy diets). Transformative change can also occur through individual actors being empowered to affect the surrounding system, thus delivering scalable individual action (Chapter 13). Such empowerment can come through removing obstacles to change, such as entrenched policies and societal values that tend to stymie new developments (Hall & Dijkman, 2019). In the search for just and equitable food-system transformation, politics is key, including management of competing claims and objectives, and recognition of the diversity of actors and institutions and their interconnections across sites, scales, and sectors.

Policies and Institutions: Organisations and institutions arise from shared cultures; each has its own approach. In the context of food systems, relevant actors include consumers, retailers, processors, producers, research entities, governments, and multilateral organisations. By presenting new options, enabling action, rewarding progress, or penalising unwilling actors, organisations and institutions interact in multiple ways to produce food-system outcomes, which may cascade to other systems and sectors as well (Chapter 11). Public investments and policies will likewise stimulate necessary changes, including by de-risking the pursuit of transformative pathways through new incentives, infrastructure, and support (Chapter 5).

***Research and Innovation*:** Organisations involved in research and innovation can drive transformation (Chapter 3). While research typically relates to the generation and application of original knowledge, innovation refers to the creation of new values or utilities by using or combining existing knowledge and processes. Innovation stimulates transformational change whereby one product or process can displace another to improve value for the end user. Research, meanwhile, informs transformative pathways to ensure that the most effective and impactful options are pursued through considered monitoring, evaluation, and learning with the goal of maximising co-benefits and managing trade-offs. Research and innovation can themselves be transformed (Chapter 14).

***Partnerships and Alliances*:** Partnerships and alliances occupy the dynamic and evolving space where food systems, organisations, and society intersect. To transform food systems, governance and power relations must undergo reform, and actors will establish new and unconventional partnerships and coalitions that espouse sustainability and equity while working towards societal change. Governments at all levels will remain key innovation partners and enablers in creating policy and public investments. Investors – including donors, the private sector, and philanthropists – and public agricultural research organisations will engage and experiment with players whose pioneering activities could disrupt dominant market forces (Chapter 16) (Hall & Dijkman, 2019).

Numerous voices and discourses about the transformation of food systems advance agendas that range from human and planetary welfare to profit and political power. In this situation, a common vision may be difficult to achieve. Dialogues can forge common interests rather than only conveying or entrenching the positions of different and often opposing groups. The visions with the greatest leverage may be those where a broad range of views and components converge to identify common interests and modify structures that limit collective agency. The visionaries may include, for example, multinational corporations, food sovereignty movements, or animal welfare perspectives. Converting their transformative visions into action will entail an understanding of how existing power relationships may facilitate or hinder change in order to address disempowerment and marginalisation, so that our future food systems are sustainable and equitable for all.

1.4 Agricultural Research for Development and Food-System Transformation

Agriculture is an important sector in the economies of many lower- and middle-income countries and provides an entry point for effective strategies for poverty reduction. Working towards this goal, CGIAR is a large global collective of international, publicly funded agricultural research for development (AR4D) institutes. Since its establishment in 1971, CGIAR has spent about US$60 billion in present-value terms; this investment has returned tenfold benefits including greater food abundance, cheaper food, reduced rates of hunger and poverty, and a smaller geographical footprint for agriculture (Alston et al., 2020). Although funding of CGIAR represents only 3 percent of public investment in lower- and middle-income countries, the collective has delivered considerable international public goods and played a key role in building national research capacities to deliver impacts at scale (Beintema & Echeverria, 2020).

CGIAR sought to systematically address climate change through its Research Program on Climate Change, Agriculture and Food Security (CCAFS), which ran from 2009 to 2021. The Program invested around US$350 million in action research involving all the international agricultural research centres of CGIAR and integrating thematic work across multiple global, regional, and local partners. It identified and tested pro-poor adaptation and mitigation practices, technologies, and policies to enhance food systems, adaptive capacity, and rural livelihoods. In ways that benefit the rural poor, CCAFS also provided diagnosis and analysis to guide cost-effective investments, the inclusion of agriculture in climate change policies, and the inclusion of climate issues in agricultural policies, from the subnational to the global level (Vermeulen et al., 2012). For more than a decade, CCAFS and hundreds of its partners worked closely together on a food-system transformation agenda. Collectively, they showed how research can make an enormous difference over relatively short timelines, if the process is outcome-orientated and appropriate partnerships and mechanisms are in place (Chapter 3).

This book both distils lessons learned from this prominent effort to reimagine AR4D and lays out an agenda for the transformation of food systems. It has three sections. This first, introductory section sets out the 'what' of agricultural transformation and the four action areas that are needed to accomplish it (Chapter 2). These action areas are as follows: rerouting farming and rural livelihoods towards new trajectories; de-risking livelihoods, farms, and value chains; reducing emissions; and realigning policies, finance, support for social movements, and innovation. This initial section also demonstrates the key role of AR4D (the 'how', Chapter 3).

The second section lays out an agenda for transformation based on the four action areas, identifiying the priorities for eleven concrete actions and showcasing successful examples to demonstrate that change is feasible. These eleven actions relate to deforestation, agricultural production, market development, digital advisory systems, early warning, food loss and waste, dietary shifts, policy and institutional change, social movements, innovation systems, and financial mechanisms (Chapters 4–14).

The third section of the book discusses and illustrates four principles for outcome-orientated research for transformation: theories of change (Chapter 15), the critical role of partnerships (Chapter 16), working across scales (Chapter 17), and leadership and management (Chapter 18). Throughout these chapters, examples are drawn from research about the climate–food nexus. Some are from CCAFS and its partners, and some from other organisations and initiatives. The book ends with a short concluding chapter summarising its major points and looking forward towards requirements for food-system transformation (Figure 1.2) .

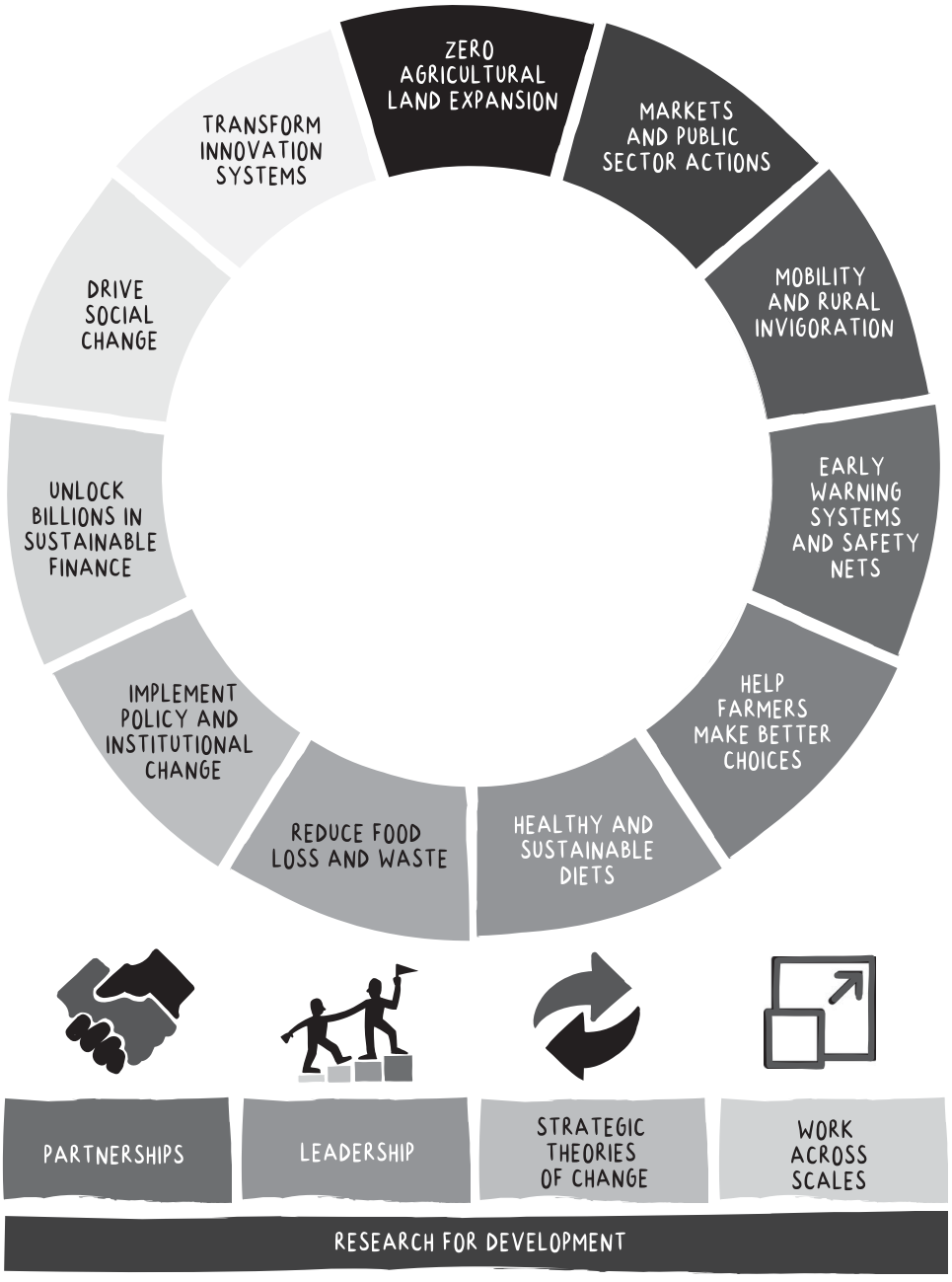

Figure 1.2 An illustrative summary of the book

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