

# Towards food systems transformation – five paradigm shifts for healthy, inclusive and sustainable food systems

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ISBN 978-92-9266-212-7

Printed February 2022

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This paper was originally commissioned as a background paper for the 2021 Rural Development Report: *Transforming food systems for rural prosperity*.  
[www.ifad.org/en/rural-development-report](http://www.ifad.org/en/rural-development-report)

## Acknowledgements

The authors take full responsibility for the contents of this paper, the production of which has benefited from helpful comments from a committee of experts led by Bart de Steenhuijsen Piters, Joost Guijt, Romina Cavatassi, Leslie Lipper, Ruerd Ruben, Eric Smaling and Siemen Van Berkum, and other members of the IFAD Rural Development Report working group. This work was made possible through the financial support of IFAD in close collaboration with Wageningen University and Research Centre. This background paper was prepared for the Rural Development Report 2021 *Transforming Food Systems for Rural Prosperity*. Its publication in this original draft form is intended to stimulate broader discussion around the topics treated in the report itself. The views and opinions expressed in this paper are those of the author(s) and should not be attributed to IFAD, its Member States or their representatives to its Executive Board. IFAD does not guarantee the accuracy of the data included in this work. For further information, please contact: [ifadknowledge@ifad.org](mailto:ifadknowledge@ifad.org).

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**Conflict of Interest:** The authors declared that they have no conflict of interest.



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## Abstract

Food systems must serve different societal, health (both public and individual) and environmental objectives. They therefore face numerous challenges. Considering the integrated performances of food systems, this paper highlights five fundamental paradigm shifts that are required to overcome trade-offs and build synergies between health and nutrition, inclusive livelihoods, environmental sustainability and food system resilience. We focus on the challenges to raise policy ambitions, harmonize production and consumption goals, improve connectivity between them, strengthen food system responsiveness and anchor inclusive and participatory governance of food systems. Taken together, these paradigm shifts shape a new narrative for food system transformation that will be capable of responding to current and future policy challenges.

**Keywords:** Food systems transformation; paradigm shift; trade-offs; synergies; governance



# 1. Introduction

This series on food system transformation, published in *Food Security*, looks at challenges, prospects and strategic options for transforming food systems to become:

- **Healthy and nutritious** – providing nutritious and affordable diets for good health
- **Inclusive** – enabling a decent living for those who work in the food system to ensure no one is left behind
- **Environmentally sustainable** – consuming and producing food whilst respecting planetary boundaries.

Meeting these three objectives in transformed food systems would also imply food systems that are:

- **Resilient** – ensuring that people can access food and protect their livelihoods when food systems are hit by extreme events or market shocks and political instability or conflicts.

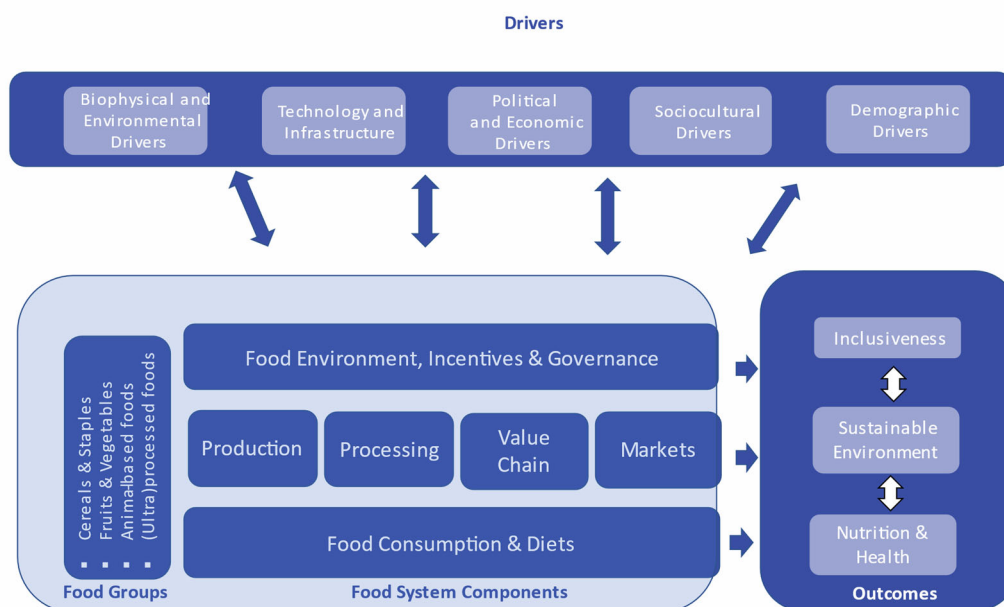
Around the world, imbalances and disconnected food markets and governance are forcing undesirable trade-offs between food supply and consumption patterns with nutrition, livelihoods, environment and resilience. These are key concerns for the 2021 United Nations Food Systems Summit and discussed in the *Rural Development Report 2021: Transforming food systems for rural prosperity* by the International Fund for Agricultural Development (IFAD). Current trends in poverty, malnutrition and climate change reflect widespread food system failures. To address the trade-offs and make progress in all areas, we need a clear view of how food systems are organized and how different stakeholders interact.

Our special concern is poor people living in both rural and urban areas. What will food system changes mean for employment and small-scale producers? What kind of food system transformations can improve nutrition? What factors drive the transformation of food systems in less developed countries? Can these drivers interact in ways that will promote healthy, inclusive and sustainable food systems? Will the resulting food system respect planetary boundaries and improve the state of world ecosystems? What policy instruments can support such transformation processes? What is the role of governance and what kind of governance is needed to ensure such transformations?

Two constituencies are at risk of being left behind in the transforming food systems. On the one hand, about half a billion small-scale rural producers including farmers, herders and fishers, and some 2 billion food value chain workers are currently too poor to have secured economic access to basic food requirements (Global Nutrition Report, 2020). On the other hand, healthy diets are now out of reach for at least 3 billion people. The Covid-19 crisis has substantially increased this number (Hirvonen et al., 2020; Herforth et al., 2019). In many cases, high relative food prices together with lower costs largely explain the prevalence of undernutrition and overweight. How can poverty and malnutrition be addressed through food system changes that harness opportunities while avoiding trade-offs?

Food systems include all elements and activities related to food production, processing, distribution, preparation, consumption and disposal – including market and institutional networks for their governance – and they include the outcomes of these elements for health, livelihoods and the environment. The analytic framework of the High Level Panel of Experts on Food Security and Nutrition (2017) underlies this definition of food systems (figure 1) and distinguishes linkages and feedbacks among three key food system areas:

- **Drivers** – external factors, including population growth and urbanization, technological development, climate change, trade and economic growth
- **Components** – elements directly related to food value chains (production, processing and distribution), diets (preparation and consumption) or food environments (markets and institutions)
- **Outcomes** – healthy diets, livelihood well-being including equity or inclusiveness, and sustainability, as well as resilience to climate change.



**Figure 1: Food systems analysis framework (adapted from High Level Panel of Experts on Food Security and Nutrition, 2017)**

The food environment plays a central role in the food system framework: it incorporates all the infrastructure, public and private, institutional regimes and governance frameworks that guide food availability, accessibility, quality, safety, sustainability, reliability and affordability (Caspi et al., 2012; Herforth and Ahmed, 2015; Turner et al., 2018). There are structural imbalances and disconnects that prevent the delivery of desired outcomes for nutrition, inclusion and environmental sustainability.

Opportunities for food system transformation depend largely on the scope for improving potential agricultural productivity by reducing the gaps between actual and achievable yields (van Ittersum et al., 2016), changes in land use from calorie-rich to nutrient-dense activities (horticulture, animal-based activities), as well as opportunities for improving incomes (Arslan et al., 2021). This is supported by shifting labour from agriculture to non-farm employment in trade, and processing and service sectors. Both processes have significant effects on farm size, on natural resource use, and on rural and urban incomes. The transition towards more inclusive and resilient food systems requires radical changes in all food system components: production, consumption, trade and governance.

The papers included in the series identify five paradigm shifts that are required to better understand the requirements, scope and implication of strategies towards food system transformation.

## 1.1 Raise ambitions: from food security to food system resilience

Much attention has been given to strategies for improving food security at the individual, regional and national levels. This goal can be reached through a combination of raising productivity, improving returns to labour and strengthening market connections (Tendall et al., 2015). However, it is increasingly recognized that long-term food security cannot be reached without improving the resilience of food systems (Lipper et al., 2021). This requires producers and consumers to be capable of adapting to unexpected changes in the (natural and policy) environment, relying on livelihood, diet and market diversification strategies that enable flexible and timely responses to global change. To ensure resilience and a proper link with the circular economy, such strategies must also contribute to the long-term effective functioning of food systems in providing nutritional, environmental and livelihood benefits in the process of producing, supplying, consuming and disposing/recycling of foods at varying levels and across different food system types.

The main rationale for the growing interest in food system transformation is related to the general recognition that multiple problems of poverty, malnutrition, environmental degradation and climate change

cannot be “fixed” with single interventions, but instead need a fundamental change in the dynamics of food systems (Giller et al., 2021a, 2021b; Duku et al., 2021). In response to the triple challenge of malnutrition – hunger, micronutrient deficiencies and obesity – comprehensive strategies for supporting availability, access, safety, affordability and desirability of food need to be defined.

Agricultural production from the large majority of smallholder producers creates an insufficient marketable surplus to nourish the growing urban population (Giller et al., 2021a; Barthel et al., 2019). Moreover, the growing commercial demand for food also supports a further transformation in the agrarian structure, with an increasing number of midsize farms and the reduction of average farm size operated by smallholders (Giller et al., 2021b; Jayne et al., 2016; Tschirley et al., 2015). Addressing the tension between improving the livelihoods of smallholders and realizing adequate and nutritious food supplies will be an important aspect of enhancing the resilience of the overall food system in the coming decades.

## **1.2 Harmonize goals: combine efficient production with affordable nutrition, inclusive livelihoods and environmental sustainability**

Overcoming the current trade-offs in food system performance requires decisive efforts to reach a new balance between food production and consumption in agroecosystems that are becoming increasingly fragile, for example where water scarcity and food subsidy systems meet in (semi)-arid countries (Terwisscha van Scheltinga et al., 2021). The main reason to advocate for the transformation of food systems – as opposed to single-target interventions – lies in the need to simultaneously improve nutrition, inclusiveness and environmental sustainability (van Berkum and Ruben, 2021). The connections between agriculture/food value chains with diets, human health, livelihoods and agroecosystems require harmonization of instruments (Webb et al., 2020; Fanzo et al., 2021).

While efficient food production remains critical, a sole focus on agricultural productivity has been insufficient and has led to some unintended and unwelcome outcomes. The success of poverty reduction through agricultural productivity gains has been uneven across countries (Pingali, 2015). Moreover, the way intensification has been carried out has raised environmental concerns (Giller et al., 2021a; Duku, 2021). Food systems contribute 37 per cent of greenhouse gas emissions and so a dramatic reduction is needed to comply with the Paris Agreement and mitigation needs (Lipper et al., 2021). The primary focus on increasing yields of staple crops may result in more affordable calories for consumers, but not necessarily adequate and affordable nutrition based on the nutrient-dense and diverse diets required to address malnutrition (Brouwer et al., 2021).

Reinforcing food system resilience requires a due attention to diversification. Diverse diets will improve nutrition and health if food supplies come with increased affordability and accessibility for nutrient-dense foods (Brouwer et al., 2021; Pingali, 2015). Diversifying food production can improve rural livelihoods while supporting biodiversity and the landscape management of natural resources (Bommarco et al., 2013).

Lastly, rural livelihoods can be improved when inclusiveness is ensured. Gender and inequality in food systems are strongly related. Women are actively involved in food systems, yet their contributions are often not formally recognized and they often face constraints that prevent them from engaging on terms that are equitable and fair. In the context of food system transformation, women’s empowerment is key to achieving the objectives of: (1) healthy, safe and diverse diets that meet the nutrient requirements of all household members; and (2) inclusive food systems that engage smallholder farmers in food production and ensure affordable access to diets for disadvantaged groups of consumers. The same applies to indigenous people, of whom nearly three quarters live in rural areas and are primarily engaged in agriculture-related activities and whose well-being is critical for the sustainable management of a large share of the world’s natural resources.

## **1.3 Improve connectivity: from modular exchange to midstream interlinkages**

Food system resilience can be reinforced by linking rural and urban constituencies (de Bruin et al., 2021) and by increasing non-farm and off-farm employment opportunities that absorb surplus labour. Investments in midstream small and medium-sized enterprises for local processing, storage and retail provide important

new sources of employment, support value added creation and create opportunities for circular resource use (Reardon et al., 2021). Linking farmers and consumers to reliable and transparent informal and formal markets offers the potential of contributing to better access to affordable and healthy diets and reinforces nutrition, inclusion and sustainability, as well as greater stability of food supply (van Berkum, 2021). Improved diets in turn generate substantial welfare and health benefits that may become an additional source of pro-poor growth.

Different types of connections influence food system performance. Tailoring food supply (production) to food demand (consumption) is heavily influenced by interactions between technology and behaviour (Ruben et al., 2019). The available infrastructure for transport and communication offers spatial connections for local and interregional trade between rural and urban areas (de Bruin et al., 2021; Proctor and Berdegué, 2016). Communication infrastructure and smart information and communications technology devices can become particularly helpful for the timely distribution of information, thus enabling the responsiveness of food system stakeholders to potential shocks (Ceccarelli et al., 2021).

These spatial linkages partly coincide with vertical sectoral linkages between supply chain actors that determine to a large extent the value-added distribution and the incentives for food system upgrading (Reardon et al., 2021; Liverpool-Tasie et al., 2020). The dynamics of midstream agents in charge of transport, storage, processing and retail strongly determine the responsiveness of food systems (Reardon et al., 2021). Social and environmental externalities of food system operations should be considered in the process of price formation, taking into account principles of living income, health and climate change (Alho et al., 2021). Sustaining connectivity also asks for supply chain relationships that consider the equitable distribution of value added amongst producers, traders and retailers (Waarts et al., 2021).

#### **1.4 Strengthen responsiveness: from linear agri-food value chains to circular food systems**

Food systems transformations are interactive processes that need adaptive capacity to be able to adequately respond to new and unexpected challenges. The evolution of food systems is not a linear process and multiple trends appear simultaneously (Dengerink and Guijt, 2021). Different types of food systems have varied and specific pathways for providing healthy, affordable, safe and sustainable diets, and thus need tailor-made solutions (Garbero et al., 2021). However, across all food system types, moving to circular systems based on resource recycling serves the purpose of enhancing responsive and efficient resource use.

Promoting circular food systems is based on a thorough understanding of major leakages. Reduction of post-harvest losses and waste is a critical component for increasing agricultural productivity (Stathers et al., 2020). The shelf life of many perishable products that are critical for enriching diets can be extended if upstream drying or fermentation practices are applied to reinforce food integrity downstream in the food system (Schoustra et al., 2021; Adeyeye, 2017). Strategies for improving local indigenous foods that rely upon resource recycling can also be important in supporting youth employment and female entrepreneurship (Schoustra et al., 2021).

Since global food production is the biggest driver of environmental degradation, special attention is given to strategies towards optimal use of biomass from crop-based systems, opportunities for reducing pressure on forests and biodiversity, and the possibilities for improving feed-food conversion and circularity within livestock systems (Oosting et al., 2021).

#### **1.5 Anchoring governance: from targeted incentives to integrated and comprehensive food system governance**

Policies, investments and innovations in the agricultural sector have focused on interventions to alter incentives among producers in an effort to boost production or enhance value chains. They rarely looked beyond the immediate production and profitability concerns of producers of individual commodities. This governance approach can lead to a myriad of unintended consequences within food systems since it fails to incorporate objectives such as inclusion, nutrition and sustainability, and neglects consumer and citizen

interest in the food system beyond the farm and immediate value chain. The current governance system and focus on ministries of agriculture and related stakeholders is unlikely to resolve these issues and a broader approach and thinking is needed.

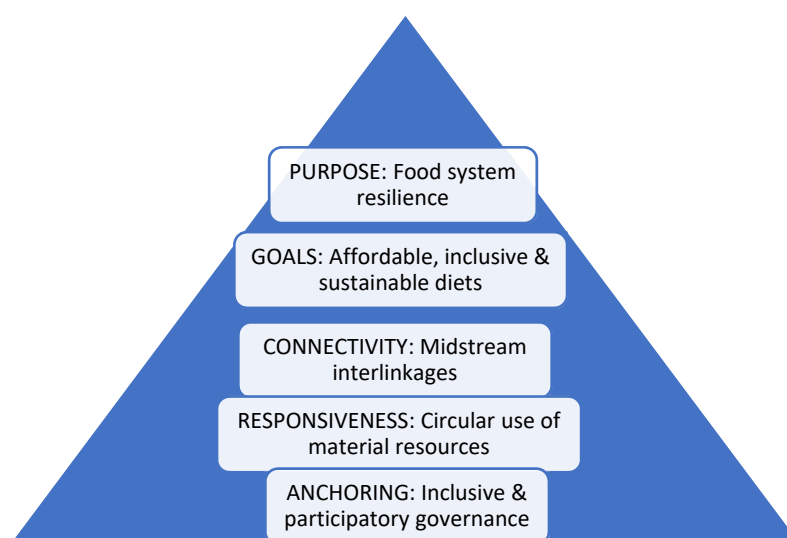
Strategies for promoting inclusive food system transformation require a sound anchoring of policy incentives, public investments and institutional and business innovations. Given the wide variety of resources and livelihoods, and the diversity in cultures and markets, food system transformation can only be orchestrated through policy experiments based on a common agenda, capacity building for all stakeholders involved and transparent feedback mechanisms (Leeuwis et al., 2021). Such a combination of technical, institutional and behavioural innovations for linking healthy consumption to sustainable food supply needs to be supported by broad participation of all relevant stakeholders.

Strengthening food system interactions is critical to guarantee that linkages between production and consumption and between rural and urban constituencies are sufficiently inclusive. It is generally recognized that women's empowerment is critical to overcoming inequalities in dietary intake. In addition to pre- and post-natal health care, providing resources and education to women reinforces their voices and their bargaining power, and contributes to the reduction of poverty gaps and a more equal distribution of food (Quisumbing et al., 2021).

## 2. Outlook and policy challenges

Engaging stakeholders in food system transformation processes is by no means an easy challenge. It requires a fundamental change in our thinking and a paradigm shift at all levels, ranging from food system analysis and diagnostics to food systems policies and governance. We need to look beyond some selective activities that intend to "repair" local failures towards a full overhaul of the dynamics of global food systems and the interactions between food system stakeholders.

Coherent policies for more inclusive and nutrient-sensitive investment are required to improve food quality, food safety and food system sustainability for broad categories of stakeholders. Both market incentives and public regulation can be used to support connectivity and enhance responsiveness. In addition, anchoring food system change requires that due attention is given to social norms and differences in preferences, priorities and power (figure 2).



**Figure 2: Food system transformation pyramid**

The five necessary paradigm shifts outlined in this series on food system transformation provide a wider understanding of the requirements and scope of food system transformation strategies that are discussed during the 2021 United Nations Food Systems Summit. The urgency for food system transformation – motivated by growing and acute malnutrition in several parts of the world and the rising environmental,

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social and health costs related to unhealthy and unsafe diets – makes it imperative to address these challenges in a comprehensive manner.

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ISBN 978-92-9266-212-7



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