IFAD RDR 2021 – Framework for the Analysis and Assessment of Food Systems Transformations

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This guidance note provide an analytical framework for the background papers that are commissioned in preparation of the IFAD Rural Development Report 2021 on Food System Transformations. It starts with an overview of different dimensions and pathways for food system transformation (section 1) and then outlines the opportunities derived from food system analysis for finding innovative opportunities (section 2). Major leverage points for public, private and civic interventions are identified that support food systems transformation processes in line with IFAD strategic priorities (section 3). Hereafter we disentangle the different drivers and components of food systems change (section 4), distinguish several archetypes of the food systems environment (section 5) and assess opportunities for food systems governance to support interactions between different – sometimes competing – stakeholders (section 6). Finally, the approach for the RDR2021 background papers is presented (sections 7). Boxes provide insight into particular investments and incentives that support food system transformation.

1. Pathways for food systems transformation

Changes in the food systems can take different directions and policy pathways will thus vary between countries and regions. Whereas attention is usually focussed on material drivers for food systems change (like agricultural intensification, rural finance, technology change, or infrastructure upgrading), it is of foremost importance to understand behavioural responses of different stakeholders for overcoming food system trade-offs and anchoring these changes.

The coming decades, we face **simultaneous transitions** in demography (rapid urbanization), social structure (growing size of middle class), changes in incomes and nutrition (declining income share devoted to food) and adjustments in dietary preferences (growing demand for fruit, vegetables and animal-based foods), together with changes in shopping pattern (purchase of processed food in modern retail and out-of-home outlets) that may lead to adjustments in farm size and land use patterns to guarantee commercial supply of food.

Different pathways for food systems change can be distinguished, depending on policy priorities and the power of key stakeholders. Intended outcomes can be identified as:

- **Healthy** and **safe** diets that satisfy the nutrition requirements of all household members enable diet diversity and contribute to reduced health costs;
- **Sustainable** production, distribution and consumption of food while maintaining the ecosystems, also considering their **resilience** to potential shocks;
- **Inclusive** food systems, engaging smallholder farmers in (efficient) food production and enabling **affordable** access to diets by disadvantaged groups of consumers;
- **Efficient** food system, that optimize the circular use of scarce resources and reduce food loss and waste throughout the system.

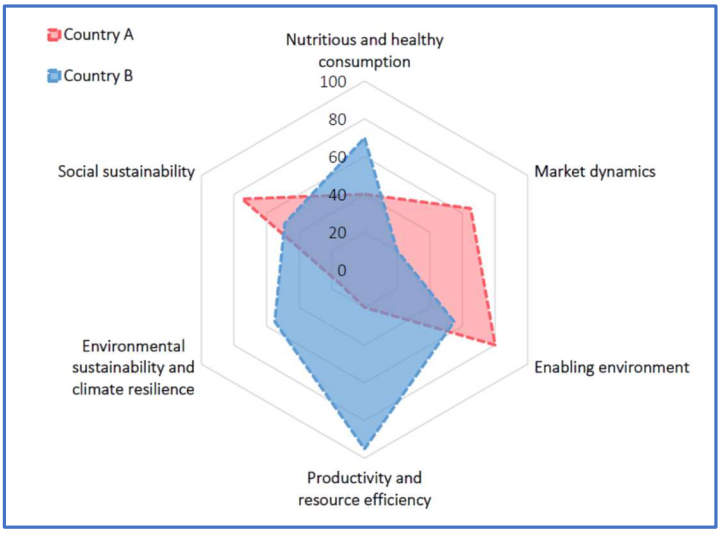
The different RDR background papers will deliver insights and evidence on the possibilities for supporting food systems transformations that respond to the IFAD strategic framework. These mainstreaming themes particularly refer:

- Livelihoods of poor and vulnerable people in rural and (peri)urban areas
- Different food system dimensions (access, safety, availability, affordability)
- Inclusion and targeting of women, youth and indigenous people
- Embedded in rural-urban linkages and spatial transects
- Attention to food systems under climate change and conflict preparedness
- Sequencing of short-term and long-term interventions

Even while the final aim will be to satisfy many or all these dimensions, **trade-offs** between outcomes are likely to occur and should also be acknowledged. Food systems transitions search for a balance incentives and investments that support simultaneous adjustments of interactions between stakeholders and synergies between components through:

- Socio-technical conversion in the food production system and the processing of food;
- Realignment of the business modalities of exchange and distribution of food;
- Changes in the governance regimes that enable new configurations for linking food production and consumption.

The food systems index (box A) is developed to characterize existing status of food systems in particular countries, providing a base of dialogue as to where stakeholders would like to see change and for articulating combinations of action to achieve this. In practice, several adjustments in food systems take place simultaneously with heterogeneous rhythm and speed and various food systems might therefore **co-exist**. Some changes start with adjustments at the level of primary production, while in other settings the transition process is initiated at governance level or motivated by consumer preferences or purchasing behaviour.



Box A: Food Systems Index

Major differences in food systems organization and performance can be visualized with a spider diagram. Countries can be compared in terms of resource endowments, market and institutional environment, consumption and nutrition outcomes and environmental sustainability. This provides insights in the major constraints and challenges for food systems transformation processes.

Differences in food system transition dynamics between countries and within regions are mainly due to local conditions that support or constrain the coordination of food system activities with positive or negative feedback loops. We aim to identify **tipping points** that lead to either large synergies (caused by spill-over and crowding-in effects) or delay changes (due to lock-in and crowding-out effects) and permit to initiate self-enforcing patterns of **triple wins** in terms of better nutrition, more resilient and responsive food supply, and adequate targeting of disadvantaged groups of smallholder producers, SME traders and poor food consumers.

Food system transformation benefit from three different **leverage mechanisms** to mitigate constraints and/or improve performance through:

- Investments that support resource allocation towards particular food system activities;
- Incentives of financial or moral nature that encourage food system stakeholders to modify their activities and behaviour;
- Innovations for adjusting technical opportunities and/or managerial practices for producing and delivering food systems products, services and/or practices.

	**Dietary diversity** is generally considered as an important condition for food and nutrition security. Programs for home gardens and vegetables seed distribution are commonly used to enhance dietary diversity. However, dietary diversification is not necessarily related only to production diversity, but could also be reinforced through more engagement in off-farm employment. (Ritzema et al., 2019). The labour market then generates opportunities for cultivating or acquiring other more diverse food products.
	Many interventions for improving diets start with changing either the supply or the demand for healthier foods. Programs that give priority to the supporting intra-household food distribution through **women empowerment** training proved to be effective for improving child nutrient intake in rural Bangladesh. (Sraboni & Quisumbing, 2018). Focussing on behavioural change proved to be more important than increasing the availability of food. Improving human health outcomes is the most important payoff of food systems interventions.

2. Analysis of food systems performance

We use a 'Food Systems' (FS) approach to analyse how interactions between food production and consumption are shaped. Food systems include all elements and activities related to the production, processing, distribution, preparation and consumption of food, the market and institutional networks for their governance, and the socio-economic and environmental outcomes of these activities. The HLPE (2017) framework distinguishes between three key aspects of the Food System (Figure 1):

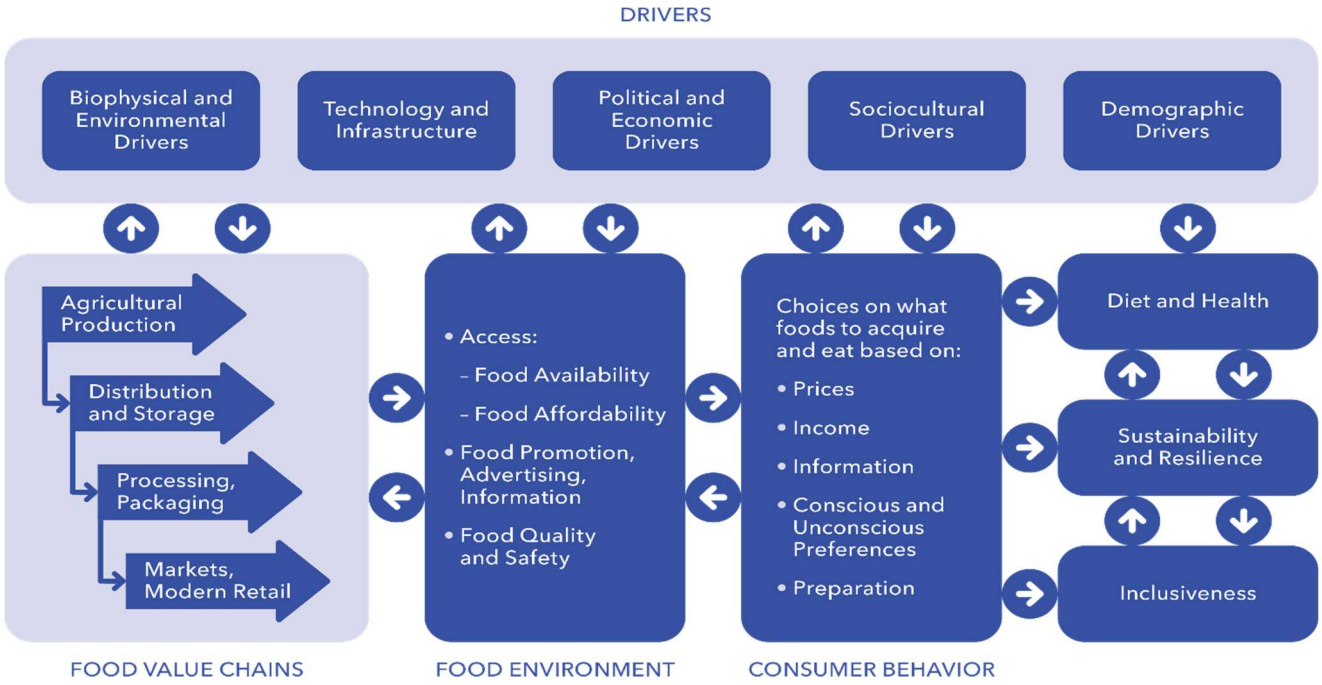
(a) food system **drivers** (external factors), like urbanization, technological change, climate change and economic growth that lead to a change in food production and consumption patterns;

(b) food system **components**: food production, distribution (food value chains) and use (consumer choices) guided by the (public & private) food environment that lead to new modalities for the supply and demand for food ;

(c) food system livelihood **outcomes**: healthy diets, sustainable food supply (resilience) and equity (inclusion of smallholder producers, young workers and poor consumers) that could either support each other or become conflictive.

Special attention is given to the importance of food system transformation for rural poverty reduction and the identification of different impact pathways for specific rural populations. We therefore distinguish between:

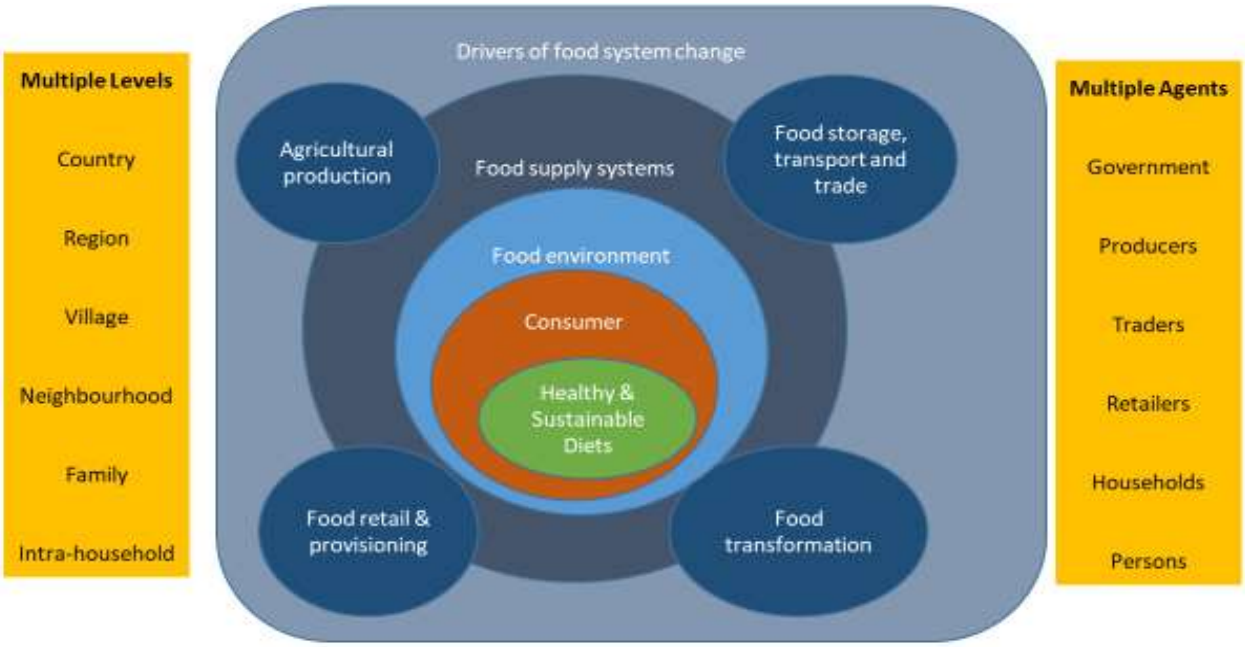
- Adjustments in land use and farm size distribution in response to growing commercial supply of food to (peri)urban populations;
- Changes in (on/off)farm rural employment related to technological and managerial innovations in farming and post-farming activities;
- Rising prices for (fresh) food products that affect purchasing power of net food consumers in urban and rural areas;
- Changes in food preferences and diets related to the expansion of modern retail and the rise in out-of-home consumption;
- Changes in climate and in risk perceptions that ask for adjustment in farming practices and rural livelihoods.



For a more detailed analysis of the interactions in the food system between production (supply) and consumption (demand) and to better understand the role of the mediating food environment, we rely on the approach outlined by GLOPAN (2016) that explicitly looks how diet quality outcomes (i.e. healthy & sustainable food systems) are embedded in consumer choices, that are influenced by the food environment and shaped by the food supply system.

This framework (see Figure 2) considers (multiple) food system outcomes that are influenced by the decisions of several stakeholders that operate at different levels of the food systems. The dynamics of food systems transformations can then be understood from the interactions between these stakeholders and the (positive or negative) feedbacks that are generated at different levels of the food system. Due attention is given to conflicting interests, power asymmetries and possible adverse effects that may result from this interaction.

Rural smallholders are a key agent in the food system, both as a producers of food and a source of wage employment, as well as consumers of food. Within rural communities, access and distribution of food is rapidly changing due to climate change and market linkages. In addition, input providers, shopkeepers, traders and processors become increasingly important in the food value chain and capture a major share of rent. Public policies and institutional regimes that shape the food environment can be helpful to provide critical protection and to support gradual adjustment of rural livelihoods.



	The relationship between food and nutrition security, **violent conflicts** and **mobility** is poorly understood. Extreme volatility in food prices and acute food shortages have been found to trigger incidents of conflict (Bruck & d'Erico, 2019). Conflicts become apparent when poverty traps and collective action failures prevail. Otherwise, research indicates that voluntary migration can improve food security both for migrants and the families left behind, particularly in rural areas (de Brauw & Ambler, 2018).
	The **role of livestock in food systems** varies between diverse settings and for different species and production systems. In early stages of food systems development, livestock provides essential nutrients and is critical for providing traction and manure. Livestock can becomes a more commercial activity for generating income and savings (Layman, 2018) Livestock production, however, also has a severe impact on the environment. Animals are often fed with cereals, causing competition for land between feed and food production.

3. Drivers of food system change

The transformation of food systems can be guided by different types of incentives that encourage, induce or motivate stakeholders to adjust production technologies and/or consumption practices. Since food systems involve both public policy and private innovations opportunities, an adequate balance has to been reached between:

- **Push i**ncentives that modify the supply conditions and cost structure in food systems, mainly through legislation, taxation (true costs) and external/internal infrastructures;
- **Pull** incentives that focus on the changing the demand side of food systems through information (labelling), social norms (nudging) or pricing.

Effective transformations of food systems depend on the governance of incentives regimes through market reforms and/or technological change. Combining different types of incentives and dovetailing public and private stakeholders into a collaborative framew3ork for joint innovation can be both inclusive and cost-effective. The combination of food system innovations with behavioural change incentives generates more structural and irreversible system outcomes.

While many programs for improving diets tend to focus on the demand side and provide targeted incentives to particular groups of consumers, it may be more effective and impactful connecting with the consumer through adjustments in the food environment for supporting healthier food choices (Turner at al., 2018). Combining demand-side incentives with supply-side restrictions may be a particularly effective strategy for steering consumers choice towards healthier diets. The combined effect of **messaging** and **incentives** also delivers transformative outcomes. Moreover, combining positive incentives and negative restrictions can be a particularly efficient strategy for supporting healthier food choices.

The transformation of food systems requires concerted efforts for harmonizing public policy and private sector innovations and investments at different levels. This involves public-private partnerships, ranging from blended finance and challenge funds for co-innovation and shared coalition programs. Also macroeconomic effects of improved nutrition for economic growth (N4G), stability and reproductive health need to be considered, as well as how food systems intensification can take place within environmental boundaries. The governance to enables Food System transformation needs to consider locally-specific power relations, risk perceptions and trust networks. There is no one-size-fits all approach to food systems change.

The political economy assessment of the effectiveness of particular interventions for nutrition, and resilience objectives needs to accompanied by a clear appraisal of **winners** and **losers** as well as some unexpected outcome under different push or pull scenarios. This implies a thorough understanding of which stakeholders participate in food systems transformation, how their changing engagement with local input and output markets is shaped, and which adjustment take place in business models and livelihood strategies.

Policies and programs that support food system transformation are simultaneously influencing the behaviour of rural smallholders and wage labourers through a variety of pathways. While market reforms may be beneficial for some (mostly larger, more commercial) farmers others might be crowded out. The same holds true for the differential effects of employment policies and labour market reforms for casual and permanent wage labourers. Climate mitigation programs could be beneficial for some landholders but detrimental for others, depending on their location and resilience capacity. The large shifts in land use accompanying the dietary transition ask for a precise analysis of the distributional implications for rural stakeholders.

	A steadily growing part of the world population lives in urban settlements. **Feeding (mega)cities** becomes a major challenge, since food imports are sometimes cheaper than locally-sourced fresh food. Improving rural-urban linkages by controlling transactions costs in local supply chains and reducing food loss and waste are considered as key strategies for urban diets. Therefore, norms and standards for food quality and safety can be combined with consumer campaigns on healthier diets.
	There are multiple linkages between **climate change** and food system transformation. Whereas climate change might threaten the production and nutritional quality of food, there are also opportunities for reducing GHG emissions through adjustments in diets (Kim et al., 2019). Focussing on modest meat intake, sustainable aquaculture systems and water-efficient vegetables production offers broad opportunities for reconciling food and climate objectives.
	**Food system innovations** - like hydroponics, seaweed and algae, etc. – are developed to support healthier diets. Adoption of innovations is usually restricted to middle-size farmers with direct market linkages. Contractual arrangements and insurance are critical for technological upgrading can be effectively supported with novel ICT tools (blockchain, drones, etc.). To guarantee inclusion, a suitable governance framework for access and use of these technologies is required.

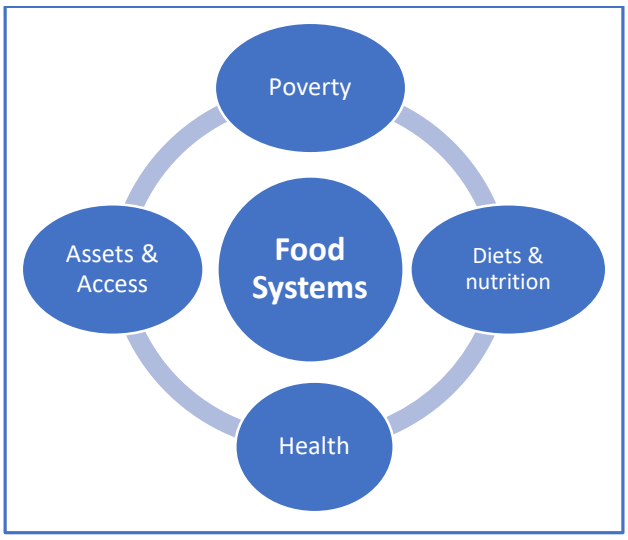
4. Dynamics of food systems

Food systems analysis provides a useful framework for generating insights into the inter-linkages between different activities and the interactions between various stakeholders (Ruben et al., 2018). It identifies useful **leverage points** for improving food system outcomes and possible strategies for overcoming trade-offs between healthy, sustainable and inclusive diets.

Key characteristics of food systems leverage points are:

- Failures in food system performance are understood from the interaction between the (external) drivers and the (internal) food system components;
- Technological innovations are considered in close relationship to behaviour changes to guarantee their sustainable adoption;
- Identification of appropriate interventions is based on sound understanding of the interactions and governance of different food system components;
- Activities and decisions of different (public, private and civic) stakeholders that are part of the food system need to be harmonized;
- Different types of incentives need to be combined to guarantee feasible pathways towards food system upgrading.
- Changes in food systems interactions generate in turn dynamic feedbacks to other components that may either reinforce or weaken aggregate food system outcomes.

We rely on food systems approach to guarantee a better understanding of the sometimes complex **causalities** between public policy interventions and private investment decisions and to enable insights into multiple food systems outcomes - in terms of healthy diets, climate responsiveness and inclusion - for different stakeholders. The systems framework explicitly acknowledges the **trade-offs** or **synergies** between different – sometimes competing – goals.



Poverty – Nutrition - Health Nexus

Many rural poor suffer from malnutrition. Net buyers of food in (peri)urban and rural areas are particularly vulnerable. Poor people devote a larger income share to food. Healthy diets are less affordable for people with limited resources.

Unbalanced diets translate into low labour productivity and high risk of diseases. This is also transferred to the next generations. Investments into better diets pay off through decreasing costs of health care, both for people as well as for the society at large (The Lancet, 2019).

Food systems analysis is particularly useful to avoid the reliance on interventions that only 'fix' the problem in the short run, but are not able to generate a systematic change in food system dynamics in the longer run. A problem-centred approach looks at *how agricultural and rural transformations respond to changing nutrition patterns and dietary demands* in rural and (peri)urban areas, and which (public and private) investments can support simultaneously process of technical and institutional innovation at different levels of the food system.

Adequate understanding of the linkages, feedbacks and interactions within food systems enable us to move from the mere description of food systems structure and its components towards a more explorative analysis of different strategies for improving food systems performance for better health and sustainability outcomes (Bene et al., 2018). A comparative appraisal of food system transition pathways provides insight into prospects for adaptive (technological and institutional) innovation strategies that guarantee synergies between outcomes and better coherence between public and private stakeholders.

A question of particular interest refers to the correlates of **poverty and malnutrition** in rural areas. Poverty rates are substantially higher in rural areas, even while migration brings more poor people to peri-urban settlements. Rural poor are usually composed of marginal producers with precarious land tenure and living in remote locations, as well as casual wage labourers engaged in agricultural and off-farm employment. Rural women and youth are particularly excluded from asset ownership and permanent employment. Rural poverty is generally associated to low levels of education, large family size, poor health care (loss of labour days), vulnerability to (climate) shocks and limited access to information.

Targeting rural poor is, however, not very effective for reducing malnutrition. It appears that in many African countries three-quarters of underweight women and undernourished children are not found amongst the poorest 20% of households (and around half of them are not even found in the poorest 40%) (Brown et al., 2019). This is largely due to co-variate risks in the local environment and intra-household socio-cultural practices. It implies that poverty programs targeting vulnerable individuals (school children, pregnant women, etc) and nutrition programs that enhance stable access to nutritious indigenous food and underutilized species might be more effective for elimination rural malnutrition.

	Programs that intend to reduce stunting and wasting usually start with improving access to food. **Safe drinking water, sanitation** and **better hygiene** practices (WASH) are, however, required as critical complementary activities to avoid risks of diarrhoeal and parasitic diseases that might invalidate any actions in the field of food production and supply (Ruel et al., 2018).
	Improving the **production efficiency** and **marketing conditions** for agricultural products is commonly envisaged as a key strategy for agricultural intensification. Even while income could be increasing, positive results for farm household food security are not always guaranteed. Encouraging small farmers to grow more cash crops more intensively may even have unintended negative consequences on dietary quality (Ickovics et al., 2019).

5. Typology of food systems

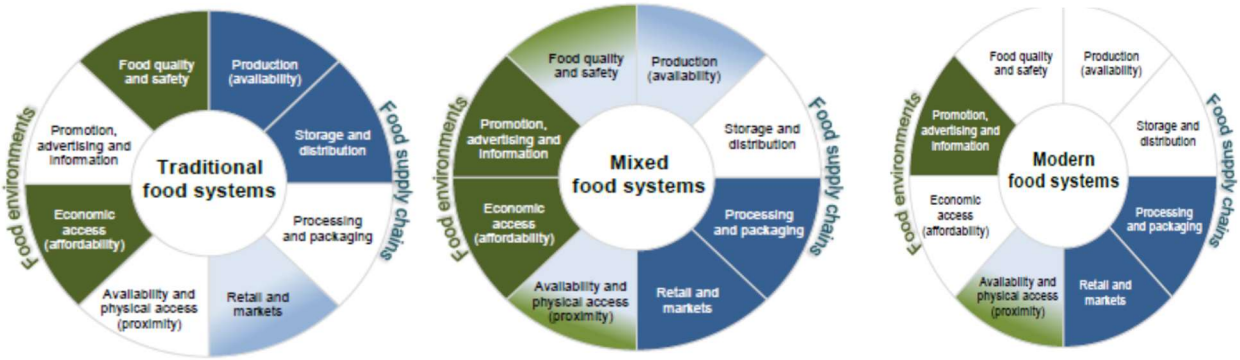
Reactions or responses to changes in the interactions between food system components are likely to vary for different types of food systems. These responses depend on several structural features of the **food environment**, like:

- Natural food environment: biophysical conditions (land, water, forest, pastures);
- Man-made food environment: infrastructure for transport, storage and communication;
- Informal market environment (guided by custom): local outlets, wet markets, street foods;
- Formal market environment (subject to legal regulation): wholesale, modernized retail, mobile venders, out of home consumption.

At the supply side, different modalities of agri-food production (smallholders, medium-size farmers, large firms) and value chain configurations (informal & formal traders, processors and retail outlets) that shape food availability are distinguished. At the distribution side, public norms and standards, private product promotion practices and physical & economic access conditions influence the safety, accessibility and affordability of food for different categories of consumers. On this basis, the HLPE (2017) distinguishes broadly three food system archetypes:

a) **Traditional** food systems, with predominantly local staple production and distribution through informal market outlets;
b) **Transitional** (or mixed) food systems, with simple food processing and sales through wet market, street food and corner shops;
c) **Modern** (or advanced) food systems, with more processed and packaged (partly imported) food that is distributed through supermarkets and restaurants.

It is important to note that several of these food system archetypes may co-exist in the same place, and that evolution of food systems over time is not always linear and might follow different trajectories. The position of small-scale farmers and rural poor also varies in each of the food systems archetypes. Traditional food systems are dominated by many small-scale farmers that deliver food to local markets, while in transitional food systems traders and middlemen become more important and capture a large share of the agricultural added value. Modern food systems are characterized by growing dualism between small-scale and larger farmers that face major differences in terms of land use, cropping pattern, market orientation and vulnerability to poverty, malnutrition and climate change.



During this food system transition, it is likely that the role and position of smallholders is subject to substantial changes. Major **challenges for inclusion** with implication for equity refer to:

- Tenancy: adjustment in farm size and land ownership structure under conditions of inheritance (fragmentation) and dynamic land markets (land consolidation);
- Farm type and land use: gradual shift from diversified small-scale family farming to more specialized medium-size farms and/or fully corporate farming;
- Cropping pattern: reduction of staple and starchy crops to meet caloric demand and expansion of a wide diversity of nutrient-dense food crops and feed for animals;
- Technology: shift from labour-intensive technologies for land preparation, harvesting and processing, to increasing reliance on capital-intensive technologies (mechanization, irrigation) that create more non-farm and off-farm employment opportunities
- Labour use: poor rural households that are self-employed operating marginal farms, or rural people that are engaged as (temporary or permanent) wage labourer;
- Value chains: linking small-scale producers to (in)formal market outlets through a range of SMEs in charge of bulking, processing and processing, compared to medium/large scale farms that engage in contract farming for sales to modernized retail outlets;
- Market linkages: focus on food security through (national or regional) self-sufficiency with smaller or larger engagement in international agri-food trade;
- Consumption pattern: shifts from rather homogeneous diets to more differentiated diets but with higher intake of (semi)processed foods and increasing reliance on out-of-home consumption

The implications of food systems transformation for smallholder **resilience** and **sustainability** also deserve special attention**.** Sustainability refers to the capacity over time to preserve the functions of the food system and its units at multiple levels, to provide sufficient, adequate and accessible food to all, whereas resilience looks at the capacity of the food system in the face of unforeseen disturbances or shocks (Tendall et al., 2015). Traditional food systems rely on diversity of local foods, internal recycling mechanisms and relational governance for absorbing major environmental disturbances. Robustness can be achieved at a relatively low, albeit stable level of food security. In transitional food systems more functional specialization is introduced and interdependencies between food systems stakeholders become more complex. Consequently, preventive actions and buffering capacity for mitigating (climate and other) shocks are highly relevant for maintaining food security. Modern food system rely on strong integration between food systems components and formal (contractual) governance, but may face at the same time global shocks due to climate change and market disturbances. Whereas capital reserves are usually maintained as a capacity for withstanding shocks, appropriate co-governance mechanisms with equitable rights, entitlements and decision-making processes to guarantee social mobilization as part of the resilience food systems framework.

The food environment provides the **governance structures** that are responsible for the coordination of activities and the alignment of different interests within the food system. This framework is critical for strategic alignment and effective enforcement of food system upgrading activities. It includes:

- **public** rules, regulations and laws that guarantee an equitable 'level playing field' for all stakeholders and safeguard public interests (food safety, competition, autonomy);
- **private** sector companies, that look for a 'licence to produce' and for suitable innovation opportunities that guarantee attractive returns to investment;
- **civic** organizations (like farmers cooperatives) and citizen networks that make a plea for food system inclusion and equity.

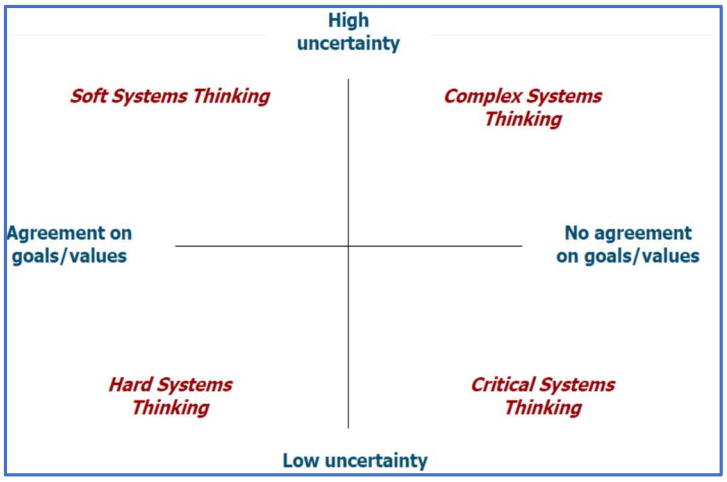
	The expansion of **modern retail networks** and the distribution of (ultra) processed foods lead to changes in shopping and eating practices. Public and private standards and food labelling are used to reduce intake of selected nutrients and influences industry practices to reduce product contents of sodium and transfats (Shangguan et al., 2019). Food labelling increases the amount of people selecting a healthier food product and are a crucial component of strategies tackling overweight and obesity.
	Fish provides more than 4.5 billion people with at least 15 % of their average per capita intake of proteins. Animal proteins from fisheries , seafood and aquaculture are critical for improving diets of the poor. There is a large potential for ''**blue growth**'' but it is also rather debated from resource efficiency and sustainability perspectives that warrant attention for adequate governance.
	**Food fortification** and **bio-fortification** are commonly used strategies for reducing micronutrient deficiencies. They can be targeted to particular products that are widely consumed by vulnerable segments of the population. Improving dietary patterns towards higher intake of fresh fruits and vegetables remains a preferred food systems strategy, but at current price levels such diets cannot be afforded by the poor (Hirvonen et al., 2019).

6. Governance of food system transformations

Processes of change in food systems are seldom linear and can take many different forms, depending on the interactions between stakeholders and their power relationships. Existing food systems may be difficult to change due to vested interests, giving room to coexistence of multiple rationales. Consequently, both planned and unplanned changes will take place and desired as well as undesired outcomes are likely to be generated.

For the analysis of food system transformations, we can rely on systems approaches that disentangle competing interests and identify **strategic leverage points** for supporting sustainable food systems innovations at policy and practice level. This asks for a detailed understanding of the interactions between formal and informal food arrangements, and the exchange between niche and dominant food environments that support or enable:

- learning from existing variation and supporting spill-overs;
- putting pressure and creating shocks on the food system;
- overcoming lock-in effects that may hinder food systems change;
- supporting social norms that enable wider self-enforcing food coalitions.



Multi-level food system governance

Food systems change takes place in an arena with different interests between stakeholders and diverging degrees of (un)certainty on outcomes. Therefore, transformation trajectories may vary from hard to soft systems and from political change coalitions to complex adaptive learning for dealing with external uncertainties and internal alliances (Geels & Schot, 2007)

The appraisal of effective governance structures at different stages of the food system transformation especially considers how public, private and civic stakeholders interact in addressing trade-offs between different food system outcomes. This might be the case when short-run objectives of (cheap) food supply counteract with longer-run criteria of sustainable food production. Or when large-scale food production for growing urban populations cannot be met with a farming structure based on small-scale family farming.

Some major governance challenges for food systems transformation refer to the restructuring public support to agriculture (e.g. differentiated effects of public subsidies on food production and environment), market differentiation (e.g. information and pricing in favour of nutrient-dense food), alliances for reducing nutrition and health risks((e.g. campaigns against overweight and obesity that combine pubic information, compulsory food labelling and civic awareness raising), and the opportunities for public-private partnerships (e.g. linking hardware and software solutions for building food infrastructure and operating agri-food logistics).

Food systems transformations require multi-sectoral approaches that simultaneously address technical and behavioural constraints from different stakeholders. Adequate understanding of the diversity of interests and the variety of drivers is critical to assess promising opportunities and effective incentives for anchoring change. It is therefore also important to identify key properties of transformative food systems governance that are based on:

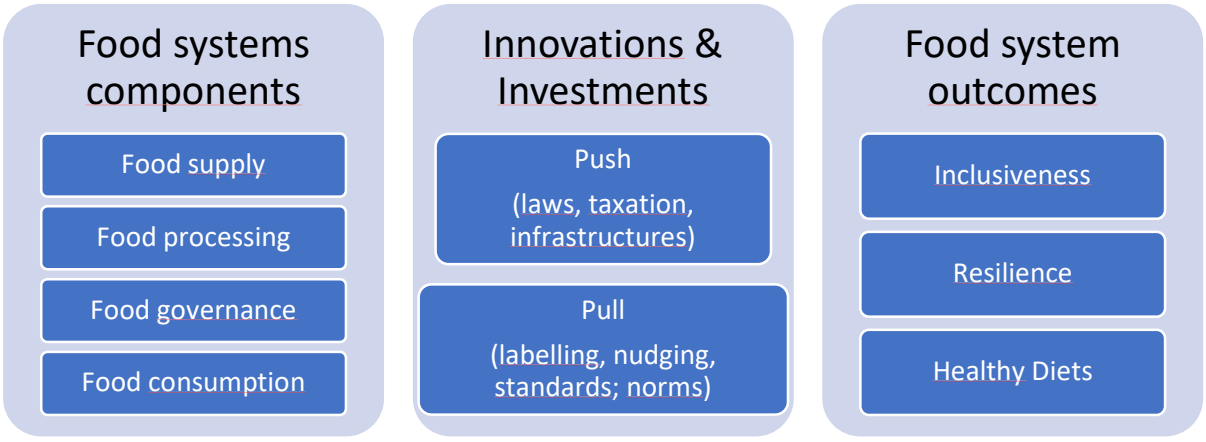
- Adaptive capacity for responding to changes and shocks (e.g. how will the agrarian structure respond to increasing food demand from rapidly growing urban population?);
- Interfaces between formal and informal food systems (how to reconciliate criteria of access, safety, stability and availability of food across different market outlets?);
- Transparent spaces for deliberation and bargaining to support co-innovation between food system stakeholders.

	Rapid changes in food governance are occurring due to the expansion of modern retail shops and supermarkets outlets in (peri)urban settings. This causes a disruption in shopping patterns and a substantive shift in food expenditures towards more processed foods. Informal (wet) markets and street foods coexist and remain important for daily food purchases. Managing **food safety** in such multi-level and multi-agency landscape requires combined actions for training, standards development and social norms (Roesel & Grace, 2014).
	Over the past decades, several developing countries have made impressive progress in reducing undernutrition. Heady et al. (2017) analyse the potential explanations for this success using multiple DHS survey rounds in sex African and Asian countries. Different forces play a role as **drivers for nutritional improvements**. Changes in wealth and assets and improved sanitation create major opportunities and reduced uncertainties, whereas education and healthcare supported social norms and enabled adaptive food system innovations. Combining multiple interventions proved to be critical for lasting results.

7. Framework for RDR2021 background papers

For the preparation for the IFAD Rural Development Report 2021 , five cornerstone papers are commissioned (see Annex) that provide insights in trends and challenges in each of the key dimensions of the food system (sustainability of food production, nutritious diets, food processing and trade, and food governance). In addition, a series of more specific background papers are defined that address particular aspects of the food system and/or outline the evidence base for specific food systems investment, innovations or incentives.

All studies are expected to devote attention to the drivers of food systems transformation processes (change dynamics), and identify trade-offs or synergies between healthy diets, sustainability (climate resilience & biodiversity) & inclusiveness. In addition, these studies should provide evidence on impact (what works, where and when & why?) and identify governance modalities for steering interactions between technical and behavioral change.

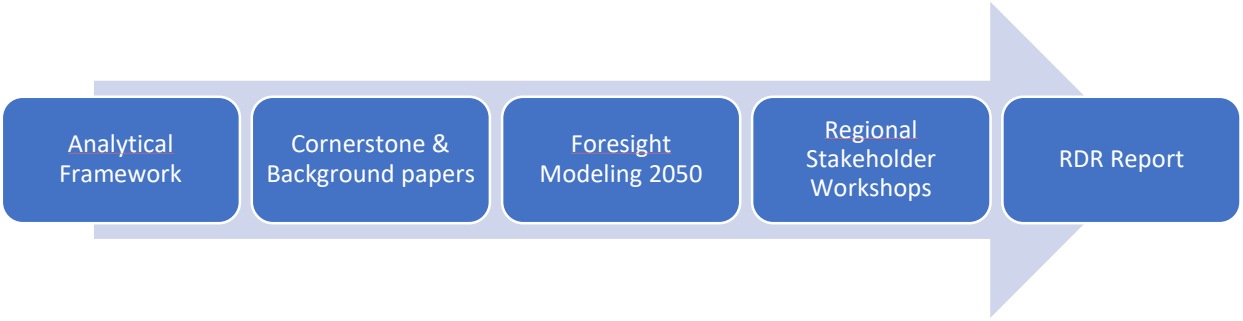


Each of the background papers will address the following general questions:

1. What is the evidence on the dynamics and interactions between food system components?
2. Which are leverage points for effective food system innovations and investments?
3. What impact on food system outcomes for particular target groups can be realized?

The **process** for preparing the RDR2021 report includes four key components:

a) Development of analytical framework for assessing food systems transformations;
b) Commissioning of cornerstone papers (focussing on key food system dimensions) and background papers (focussing on particular food system change pathways); see annex 1
c) Foresight modelling of potential trade-offs between food system outcomes towards 2050 (using MAGNET approach);
d) Regional stakeholder workshops to assess impact of interventions and to identify key issues and relevant policy messages.



Annex 1: List of RDR2021 Background Papers

A. Cornerstone papers (focus on food system dimensions)

1. Reverse thinking for food system transformation: from diet outcome to poverty impact
2. Who will produce our food? Farming trends for sustainable food system transformation.
3. Potential of the hidden middle in inclusive agri-food system transformation
4. Role of markets and trade to support food system transformation.
5. How do food systems change? Governance for orchestrating food system transformation.

B. **Background papers** (focus on impact evidence of food systems transformation processes)

1. Reginal trends in poverty, food insecurity and malnutrition
2. Nutrition – biofortification - health linkages in food systems transformation
3. Natural resources, climate change and food systems transformation
4. Animal and seafood proteins and food systems transformation
5. Role of (ultra)processed foods and food systems transformation
6. Food safety in formal & informal markets and food systems transformation
7. Food waste & losses - Opportunities for circular food systems
8. Contributions of ICT to food systems transformation
9. Power structures in food systems transformation
10. Targeting the poor in food system transformation (Living income and Cash transfers)
11. Women empowerment and food systems transformation
12. Impact of certification and food labelling on food systems transformation
13. Food system transformations in China and India
14. Rural-urban linkages & food systems transformation in growing cities
15. Role of exports commodities in local food systems transformations
16. Contribution of food systems transformation to economic growth (N4G)
17. Hunger, conflict, instability, migration and food systems transformation
18. Prospects for food innovation (algae, seaweed, insects, hydroponics, cultured meat, etc.)

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