One planet
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Sustainable
Food Systems

UN environment

Collaborative Framework for Food Systems Transformation

A multi-stakeholder pathway for sustainable food systems

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About the One Planet Network Sustainable Food Systems Programme

This publication contributes to the goal of the One Planet Network Sustainable Food Systems Programme (referred to as SFS Programme in this document) to accelerate the shift towards sustainable food systems. It was developed in the context of the core initiative "Setting the table for our children: Improving governance of food systems through multi-stakeholder action".[1]

The SFS Programme is one of six thematic programmes formed to implement the commitments of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP).[2] It is a collaborative multi-stakeholder partnership that promotes a systemic approach to accelerating the shift towards more sustainable food systems.

The SFS Programme brings together existing initiatives and partnerships working in related areas, highlights good practices and success stories, and builds synergies and cooperation among stakeholders to leverage resources towards mutual objectives and minimize duplication of ongoing efforts. The SFS Programme's work portfolio comprises Core Initiatives and Affiliated Projects. This portfolio provides the basis from which the network can report on its progress to policymakers, UN officials, business leaders, and the general public.

The Federal Office for Agriculture of Switzerland, WWF, Hivos, and the Department of Trade and Industry of South Africa co-lead the SFS programme.

More information, and ways to participate, can be found at: http://www.oneplanetnetwork.org/sustainable-food-system

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1 For more information, please see: http://www.oneplanetnetwork.org/initiative/setting-table-our-children-improving-governance-food-systems-through-multi-stakeholder.

2 The 10YFP was adopted by Heads of State and Government at the United Nations Conference on Sustainable Development (Rio+20). Responding to the call of the Johannesburg Plan of Implementation, they thereby strengthened their commitment to accelerate the shift towards sustainable consumption and production (SCP) patterns. Sustainable consumption and production has been included as a stand-alone goal of the 2030 Sustainable Development agenda (SDG12), and Target 12.1 calls for the implementation of the 10YFP.

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Objective and Development Process

UN Environment led the development of this Collaborative Framework for Food Systems Transformation (FS Framework) in the context of the SFS Programme, with the objective of engaging and building capacity of governments and stakeholders to apply a food systems approach to their policies, programmes, and strategies, in order to achieve Sustainable Food Systems (SFS).[3] Between October 2017 and December 2018, UN Environment organized several consultations around the usefulness of such a Framework. Consultees were asked to respond to the following questions: i) Is the implementation of this Framework feasible and useful in a given situation? ii) What are the main gaps? iii) How could it be improved?

In line with these consultations, this document provides an approach for collaborative policymaking and governance improvement for sustainable food systems. This includes a broad range of actions for better assessment, design, implementation, and monitoring of SFS policies and programmes by policymakers and stakeholders, leading to better decisions and outcomes regarding livelihoods, health, nutrition, and the environment.

The publication is enriched with eight cases studies that provide insight into how the principles and actions discussed in this document have been partially implemented in practice.

It is important to note that the views and conclusions expressed in this publication do not necessarily reflect the official view of the individual members of the SFS Programme or of any other organizations that were consulted in the preparation of this report.

3 The FS Framework is largely based on scientific findings presented by the UN Environment-hosted International Resource Panel (IRP), particularly the IRP's "Food Systems and Natural Resources" report. Likewise, the FS Framework draws on lessons learned from other initiatives of UN Environment and its partners that contribute to a holistic approach to food systems. For example, the TEEBAgFood valuation framework on agriculture economic externalities, reports from the FAO such as the "Strengthening Sector Policies for better Food Security and Nutrition Results", and lessons learned from RUAF Foundation with multi-stakeholder planning, all contributed to the creation of the FS Framework.

Contents

Key terms and definitions

10YFP / 10-Year Framework of Programmes on Sustainable Consumption and Production	The 10YFP is a global commitment and framework of action that was adopted at the United Nations Conference on Sustainable Development (Rio+20) in 2012, in response to the need to accelerate the shift towards SCP in both developed and developing countries (One Planet Network).
Environmental externalities	Environmental externalities refer to the economic concept of uncompensated environmental effects of production and consumption that affect consumer utility and enterprise cost outside the market mechanism (Unite 1997).
Feedback loop	A feedback loop gives information about the functioning of the systems that may later change the policy intervention or its effects. Feedback reinforces what the organization has already learned and guides future learning processes, on both the individual and organizational levels (OECD 2017a).
Food security	Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization, and stability. The nutritional dimension is integral to the concept of food security (FAO 1996).
Food systems	Food systems gather all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation, and consumption of food and the outputs of these activities, including socioeconomic and environmental outcomes (HLPE 2014).
Governance	Governance can be defined as a "system of rules, authority, and institutions that coordinate, manage, or steer society" (UNEP 2016).
Nutrition	Nutrition is the intake of food, and the interplay of biological, social, and economic processes that influence the growth, function, and repair of the body (FAO 2013, as cited in FAO 2017).
Policy coherence	Policy coherence refers to consistency, comprehensiveness, and harmonious-compatible outcomes across policy areas and sectors without compromising the integrity of policymakers' goals (Dubé et al. 2014, as cited in FAO 2017).
Sustainable diets	Sustainable diets are "...those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" (FAO 2010).
Sustainable food system	A sustainable food system is "a food system that delivers food security and nutrition for all in such a way that the economic, social, and environmental bases to generate food security and nutrition for future generations are not compromised" (HLPE 2014).

1. Introduction

Food systems are at the heart of many challenges facing the global community, from food insecurity to resource conservation and climate change. These challenges are interrelated and require a food systems approach.

Photo: Torsius, Dreamstime.com

Food systems are at the heart of the 2030 Agenda for Sustainable Development. Without eliminating hunger and improving the health and nutrition of the world's population, the 2030 Agenda for Sustainable Development cannot be effectively realized. Achieving these objectives is also intrinsically connected to the global challenge of reducing environmental impacts from the production and consumption of food. Designing and implementing sustainable food systems policies and programmes in a systemic way can help achieve at least 12 of the 17 Sustainable Development Goals (SDGs) (UNEP 2016).

The challenges involved with building truly sustainable food systems are multidimensional and interrelated, and thus require a holistic approach: examining food systems as a whole rather than in separate pieces, valuing outcomes over processes, and embracing a variety of voices instead of individual perspectives. **A food systems approach to policymaking and implementation** connects elements within various policy agendas—primarily environmental, agricultural, health, trade, and industry—widening the opportunities for any country or city to achieve sustainability in the food systems around them.

This publication presents a coherent **Collaborative Framework for Food Systems Transformation** (the FS Framework) that recommends key activities across the food system for accelerating the transition to sustainable food systems. The FS Framework is primarily intended for **national or local government departments** that are responsible for establishing institutions and designing and implementing policies at the local or national level to develop food systems in line with national objectives and goals. Moreover, the Framework explains how different **stakeholders** (e.g., civil society, private companies, research institutes, etc.) can help implement these policies and support governments in advancing a systemic transformation.

The FS Framework will facilitate the establishment of more sustainable food systems policies and programmes, at the national and local levels, underpinned by more robust and adaptive governance structures to handle the current complexities of food systems. In turn, the Framework contributes to the achievement of several SDGs, in particular SDG 2 and SDG 12.

Figure 1: The 4 actions of the FS Framework

Action 1

Identify an individual or group of food systems champions

- Call attention to and advocate for the need to adopt a different approach to food and agriculture policies – a food systems approach.
- Raise awareness and speak at public events to spread the message concerning the key benefits of systemic thinking.
- Organize trainings on a food systems approach.
- Seek buy-in of high-level representatives.

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Action 2

Conduct a holistic food systems assessment

- Prepare a diagnosis, based on food systems lenses – i.e. What is the present state of the food system today?
- In a first phase, do not break the assessment into food systems sub-sectors or focus on a too narrow problem.
- The assessment is a basis of evidence for further discussions between stakeholders.
- It provides a foundation for a political agenda and cross-cutting dialogue within the government.
- The assessment will provide an in-depth understanding of the elements, drivers, and outcomes of food systems, identify who are the main actors involved, catalogue existing policies and activities related to food and agriculture, and review potential linkages with existing strategies.

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Action 3

Initiate a multi-stakeholder process for dialogue and action

- Establish a permanent multi-stakeholder platform.
- Through this type of dialogue, politically sensitive issues that were previously uncomfortable can be addressed.
- Discuss the assessment with the multi-stakeholder group.
- Create a joint vision: discuss areas of priorities, targets and roles.
- Develop an Action Plan for SFS.
- Promote integration among different food systems policies and domains.
- Link with existing development strategies and (inter) national commitments.

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Action 4

Strengthen institutional capacity for long term food systems governance

- This action will empower public institutions to manage and guide the management of food systems to long-term outcomes.
- Create a mandated mechanism to improve institutional arrangements and frameworks (agriculture, environment, finance, health, education, etc.).
- Develop a platform where policies, laws, regulations, and programmes are continually reviewed, improved, and implemented.
- Define key performance indicators.
- Monitor and review based on lessons learned.

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2. Why do we need food systems transformation?

Governments face increasing difficulty in their efforts to achieve sustainable food systems. Outcomes include intense natural resource use, poverty and hunger, climate change, and health impacts.

Photo: UN

2.1 Current food systems policies and governance

Governments at all levels face increasing difficulty in their efforts to achieve sustainable food systems. This is primarily explained by the fragmented nature of, and silo approach to, food and agriculture policies (Ingram, Ericksen, and Liverman 2012) and the tendency of institutions to try to solve food insecurity challenges by focusing mainly on production-level approaches[4] (TEEB 2018). As a result, food system problems are often tackled through isolated interventions, with a focus on end-of-pipe solutions rather than root causes.

Food systems present complex challenges whose scale and nature call for a systemic approach to problem solving. However, adopting such an approach requires rethinking food system governance, increasing strategic capacity for policymaking and implementation, and moving towards more collaborative actions. Without diverse perspectives and sufficient engagement among food systems actors from the local level to the global, it will be almost impossible to minimize trade-offs and promote viable solutions to food systems challenges (Sustainable Food Systems Programme).

2.2 Current food systems outcomes and challenges

FAO estimates that by 2050, to satisfy the demands of a growing and wealthier population with an increased meat demand, food production will have to increase by at least 50 percent (FAO 2017). This 50-per-cent increase will further escalate environmental pressure around the world and impact peoples' health and livelihoods. A growing population, a degraded natural resource base, food loss and waste, and climate change, together with unsustainable trends in food consumption (characterized

4 The roots of this mindset are the high population growth and total fertility rates of the 1960s, coupled with insufficient food productivity, as well the success of the Green Revolution in increasing agricultural yields.

Photo: rawpixel, Carol M Highsmith

by the accelerated transition in developing and emerging economies from traditional to more western diets, which tend to contain more processed food and are rich in animal products) and production, combine to present a serious threat to the global food system.

Globally, the food sector is a dominant user of our natural resources (UNEP 2016). Unsustainable agricultural production consumes a large share of the world's available fresh water, and has contributed to widespread deforestation, biodiversity loss, land degradation, and conversion of natural habitat. Unsustainable fishery practices often result in devastating impacts on the aquatic environment and its resources. Today, almost 30 percent of global fish stocks are overexploited, and about 57 percent fully exploited (FAO 2012). Significant amounts of energy are used in producing agricultural inputs; in post-harvest processing; and for transportation, distribution, and preparation of food; as well as for the disposal of organic wastes.

The current focus on food production is not solving food systems issues. The world produces enough food to feed all of its population. Yet almost 800 million people go hungry and two billion are malnourished, lacking the essential nutrients they need to lead healthy lives. Globally, the number of overweight people has reached more than 1.9 billion adults, with over 600 million classified as obese (HLPE 2017). These figures illustrate profound imbalances in consumption and diets.

Food losses and waste around the world account for up to 30 percent of the total global food production (FAO 2011b). This adds to food insecurity, wasted natural resources (such as land, water, minerals), and wasted labour and energy expended to produce the food (UNEP 2016). Disposal of food waste in landfills is a significant source of methane emissions. A reduction in food waste and changes in diet will have an effect on the total demand of food production, while simultaneously reducing pressure on natural resources and the environment (UNEP 2012).

Food systems contribute to and are impacted by climate change. The dependence of global food systems on fossil fuels contributes to GHG emissions and may increase input costs to the extent that they become unaffordable (FAO 2011). Agriculture is linked with intensifying climate change due to livestock production, fertilizer application, and deforestation for farm expansion. On the other hand, food systems are highly vulnerable to climate change as weather patterns become more volatile, causing land degradation and erosion. Yields are also impacted by increasing day-night temperature variations. This vulnerability is exacerbated by less-diverse food demand, which decreases biodiversity while increasing the number of outbreaks of transboundary pests and diseases, further jeopardizing food security (FAO 2017).

According to recent IPCC projections, climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C. Populations that are at disproportionately higher risk of adverse consequences with global warming of 1.5°C and beyond include disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods (IPCC 2018). The implementation of land-based mitigation options would require overcoming socioeconomic, institutional, technological, financial, and environmental barriers that differ across regions.

OECD-FAO's medium-term projections expect prices of major commodities to rise to levels above the pre-2008 period as global food consumption continues to increase. This might become a problem for lower income classes, who spend a significant part of their income on food and are net buyers of food, therefore increasing their vulnerability to price peaks (UNEP 2016). In cities, poverty concentration goes hand-in-hand with growing food insecurity and malnutrition. Income and price variation affect the diets of the urban poor, limiting their access to adequate quantities of nutritious food (Dubbeling, Zeeuw, and Veenhuizen 2010).

Women only represent between 5 and 30 per cent of all agricultural landholders in lower income regions, despite being responsible for 60 to 80 per cent of food production (TEEB 2015). Closing the gender gap in terms of access to agricultural inputs alone could lift 100 to 150 million people out of hunger in developing economies. Promoting gender equality and women's empowerment is inextricably linked to strengthening food systems, fighting hunger and malnutrition, and improving the livelihoods of rural populations (FAO 2017a).

Food production is dependent on biodiversity and eco-systems. However, impacts of these production systems on human and natural capital are often forgotten and invisible to policymakers. Policymakers are not considering the value of natural capital and ecosystems services when making decisions. As a consequence, food is undervalued and food prices do not reflect the true cost of production (TEEB 2018).

A lack of consumer awareness around sustainable food consumption issues (food waste and especially the nutrition transition) are compounding the stress on our food systems. There is a growing global middle class with evolving tastes for resource-intensive food (e.g., more livestock products and processed foods). Combined with increasing income, this population represents purchasing power of some three billion people in emerging and developing economies (UNEP 2012). The consequence of this is a "nutrition transition"[5] from traditional diets to more "Westernized"[6] diets that impact both people and planet.

Photo: rawpixel.com from Pexels

Food systems are functioning within the context of a finite and shrinking resource base. They need to deliver increased productivity while utilizing natural resources in a sustainable manner and conserving ecosystems. Our paradigm of growth needs to broaden its boundaries beyond primary production and include efficiencies along the whole food chain, along with promotion of sustainable practices and diets.

5 Nutrition transition refers to changes of consumption patterns, both in terms of foodstuffs and related nutrient consumption. These changes include not only a shift towards higher food energy supplies but also a shift towards more fats and oils and more animal-based foodstuffs, and thus higher intakes of animal protein and fats (Schmidhuber and Shetty 2005).

6 A Westernized diet is generally characterized by high intakes of red meat, processed meat, and pre-packaged foods.

3. What is a food systems approach to policymaking and implementation?

Taking a systems approach to policymaking, implementation processes, and governance that impact food systems is potentially transformative. There are five principles that characterize this approach.

Photo: Unsplash, Peter Bond

If policymakers and other stakeholders are to be successful in tackling emerging challenges regarding food security and nutrition for all, while at the same time ensuring sustainable natural resource use, they will need **to expand their viewpoint to include the full scope of food systems**.

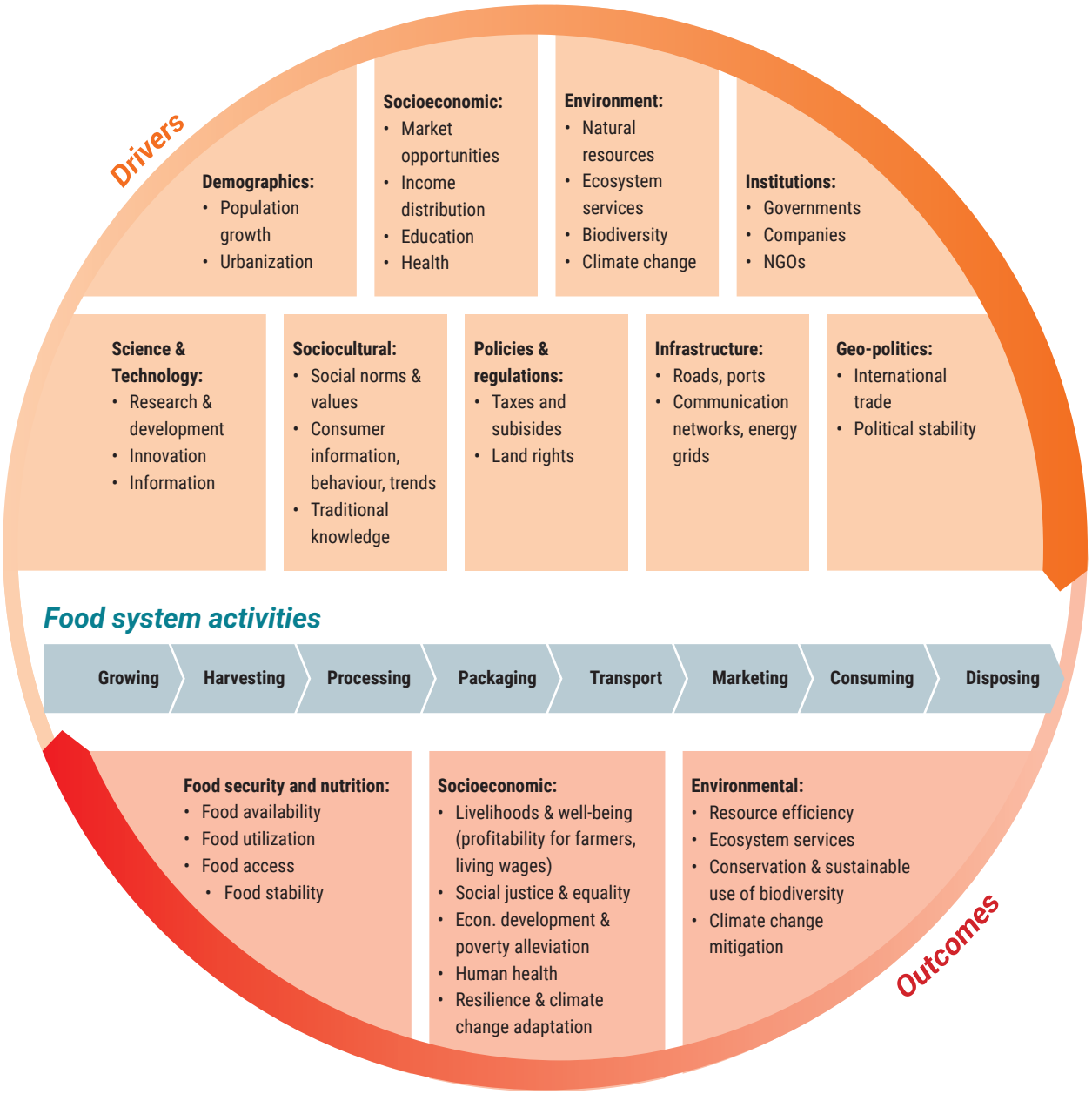
The food and agriculture sector consists of a complex web of activities, outcomes, and drivers. Food systems incorporate not only the activities of producing and consuming food, but also the social norms and cultures (for instance, dietary preferences) in which those activities are embedded, as well as the environment and natural resources which they depend upon to function (land, water, biodiversity). Moreover, food systems include people who depend on the food to live and also additional actors who influence the food sector both indirectly and directly (producers, retailers, governments, health officers, teachers, etc.). Different types of institutions, regulations, subsidies, and laws also influence everyday performance and outcomes of food systems.

Outcomes can have both positive and negative impacts on socioeconomic conditions (e.g., smallholder farmers' socioeconomic situation, poverty, employment generation, and income, etc.), the environment (e.g., forest conservation / degradation, more / less pollution, etc.), and food security and nutrition (e.g., healthy food and diets, access to food, food prices, etc.). Food systems present a "feedback loop mechanism", where activities and outcomes result in processes that feed back to the environmental and socioeconomic drivers.

Box 1: What is a food systems approach to policymaking and implementation?

This document defines a food systems approach to policymaking and implementation as the design and / or implementation of integrated interventions planned to optimize societal outcomes (environmental, health, social, and economic), resulting from enhanced cooperation among food systems actors and addressing the drivers and trends of both unsustainable food production and consumption.

Figure 2: An illustration of food systems elements, drivers, activities and outcomes (adapted from CIAT)



Food systems are incredibly complex and interlinked by trade, climate, and other factors that are not contained within borders (see above). The food production system (including agriculture, fisheries, and related food processing) generally does not geographically coincide with the food consumption system, hence the importance of trade and transportation infrastructure. Food systems range from local to global, or from subsistence agriculture to high-volume trade in commodities (UNEP 2016).

A sustainable food systems approach considers food systems in their entirety, taking into account the interconnections and trade-offs among the different elements of food systems, as well as their diverse actors, activities, drivers, and outcomes. It seeks to simultaneously optimize societal outcomes across environmental, social (including health), and economic dimensions (Sustainable Food Systems Programme).

In the policymaking process, a food systems approach helps to identify and address trade-offs in policy options. For example, it can lead to the development of nutrition recommendations that—in addition to health aspects—take into account environmental, economic, and social sustainability dimensions. This also supports the introduction of holistic food policies to ensure the provision of sufficient nutritious, sustainable, culturally acceptable, desirable, and affordable food to consumers,

while generating a decent income for producers and other value chain actors, as well as protecting natural resources (FAO 2018).

In policy implementation, a food systems approach will ensure holistic thinking persists, avoiding the return to one-dimensional responses. It will also foster continuous engagement and collaboration among food systems actors, without leaving behind those most affected by food insecurity. This develops adaptability and flexibility for responding to volatile and inherent uncertainties.

Taking a systems approach to the policymaking, implementation processes, and governance that impact food systems (→ Box 1 / page 11) is potentially transformative. Additional benefits include (Solon et al. 2019; UNEP 2016):

- Enhancing capacity for actors to work within the complexity of food systems;
- Improving the evaluation of trade-offs in policy options, as drivers and outcomes will be reviewed and holistically assessed;
- Identifying synergies and leverage points for implementing context-specific solutions;
- Enhancing coordination of policy actions, institutional frameworks, and actors, which strengthens overall food systems governance;
- Supporting more efficient use of natural resources and lower environmental impacts, while simultaneously improving societal outcomes (such as human health and rural livelihoods);
- Revealing underlying and root causes of unsustainable production and consumption patterns;
- Continuing systemic thinking and collaboration among food systems actors; and
- Increasing capacity for the delivery of integrated SFS policies, and also for achieving a number of Sustainable Development Goals.

The International Resource Panel (IRP)[7] describes, in a very practical way, the food systems concept as a combination of the food systems' activities (the "what we do") and the outcomes of these activities (the "what we get"). Throughout the policy planning process, the objective should be to mitigate trade-offs among social, economic, and environmental aspects. Only through a food systems approach will policymakers be able to analyse the unforeseen consequences of their policy interventions (UNEP 2016).

For a transformational policymaking process through a food systems approach, this document advocates for the consideration and adoption of the following five interlinked principles:

Principle 1: Focus on long-term outcomes

There is an increasing need for governments to develop a long-term vision, rather than focus on short-term policy results. A long-term outlook is necessary for delivering more sustainable, healthy, and nutritious food to a growing population, while also respecting the planet's carrying capacity. The emphasis on outcomes is desired to ensure governments and stakeholders are focused on achieving real improvements for society. Accordingly, the approach suggested in this document considers the outcomes of food systems as a starting point.

Principle 2: Include food consumption as a driver

Policies developed through a food systems lens tackle unsustainable production patterns by acknowledging the consumption drivers that shape the design of these

Photo: Claudia Ciobanu/IPS

7 The International Resource Panel was launched by the United Nations Environment Programme (UN Environment) in 2007 to build and share the knowledge needed to improve our use of resources worldwide. The Panel consists of eminent scientists who are highly skilled in resource management issues. Their reports distil the latest scientific, technical, and socioeconomic findings around global resource use. They provide advice and connections among policymakers, industry, and the community on ways to improve global and local resource management.

Photo: shutterstock, Christian Delbert

production systems (e.g., consumer preferences for processed livestock products and fast food, lifestyles, education, etc.). Such policies will also allow for the major food security and nutrition issues of undernutrition and overconsumption to be addressed directly (UNEP 2016). A food systems approach, as opposed to a solely production-oriented approach, accounts for the serious health implications arising from current food consumption patterns (diabetes, cancer, heart disease, obesity, and malnutrition, including undernutrition). It also recognizes that more sustainable diets could lead to less environmental strain.

Principle 3: Facilitate platforms of collaboration among food systems actors

Multi-stakeholder collaboration mechanisms should be promoted to acknowledge the important roles of different food systems actors (from production to consumption) in policy planning, implementation, and evaluation. Collaboration is also required in order to minimize trade-offs and overcome polarization and traditional power dynamics (OECD 2001).

Food systems stakeholders act in accordance with their context and environment (e.g., institutional regulations, tenure rights, physical environment, education and training, gender equity, food prices, cultural aspects and beliefs, etc.) (UNEP 2016). They also work in accordance with their expertise and mandate (TEEB 2018). Only through understanding their contexts, challenges, and expectations, can the government set coordinated actions that transform food systems. Within collaboration, inclusiveness is crucial to ensure advice is both representative and relevant (OECD 2017b).

Principle 4: Address emerging trends and challenges

Population growth will increase the demand for food. Urbanization and a general increase in wealth is leading to diets that are richer in resource-intensive products, such as (red) meats, ultra-processed food, and drink products. "Supermarketization"[8] is globally affecting food supply chains, while also influencing eating habits. Pressure on natural resources is expected to increase steadily over the coming decades partly due to these trends. Climate change, which will impact[9] both average weather conditions and extremes, will have a large impact on the natural resources needed for food production (UNEP 2016) and can also aggravate food security and poverty issues.

Policymakers are challenged to connect a number of food systems issues, within a complex setting (actors' relations, access to information, regulations, markets, market demand, etc.) of rapidly changing conditions. With a food systems approach, they will look at managing the impact that emerging trends and challenges have on food systems. As a result, governments will need to increase resilience and be prepared to deal with the changing dynamics within food systems.

Principle 5: Promote a common narrative and approach across relevant bodies / ministries

In most countries, numerous laws, regulations, and policies directly or indirectly influence food systems and natural resource use (UNEP 2016). Through a holistic approach, food and agriculture policies need to be connected and coherent with the wider policy / institutional set up in a way that better contributes to sustainable food systems. This means promoting cross-sectoral alignment and coordination, for example between agriculture, environment, health, business development, education, and employment. Only through effective coordination, a common vision, and an agreed plan can the transformation of food systems be realistically effective to improve food systems governance at national and local levels.

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8 Supermarketization concerns the rapid growth of the market share of supermarkets in many parts of the world (Jennings, Cottee, Curtis, and Miller 2015).

9 For instance, a trend towards greater net deficit production in some regions that requires greater reliance on trade, while extreme, can create spikes in import needs but not necessarily longer-term increases. OECD / FAO projections indicate that developing countries will become more dependent on food imports as food consumption will increase faster than the growth of agricultural production (FAO 2017c).

4. The Collaborative Framework for Food Systems Transformation

The FS Framework is a practical guide to developing and applying a food systems approach to policymaking and implementation. It suggests four actions to build a food systems transformation.

Photo: CRS PHOTO / Shutterstock.com

The FS Framework is a practical guide for policymakers and stakeholders to developing and applying a food systems approach to policymaking and implementation. The FS Framework aims to enhance the capacity of countries and cities to transition to more sustainable food systems, in accordance with international commitments and governance, such as the 2030 Agenda for Sustainable Development (→ Box 2 on the right). It includes practical and easy-to-follow actions for performing analyses of food systems, expanding or reorienting existing activities, integrating policy interventions, and building effective food systems governance.

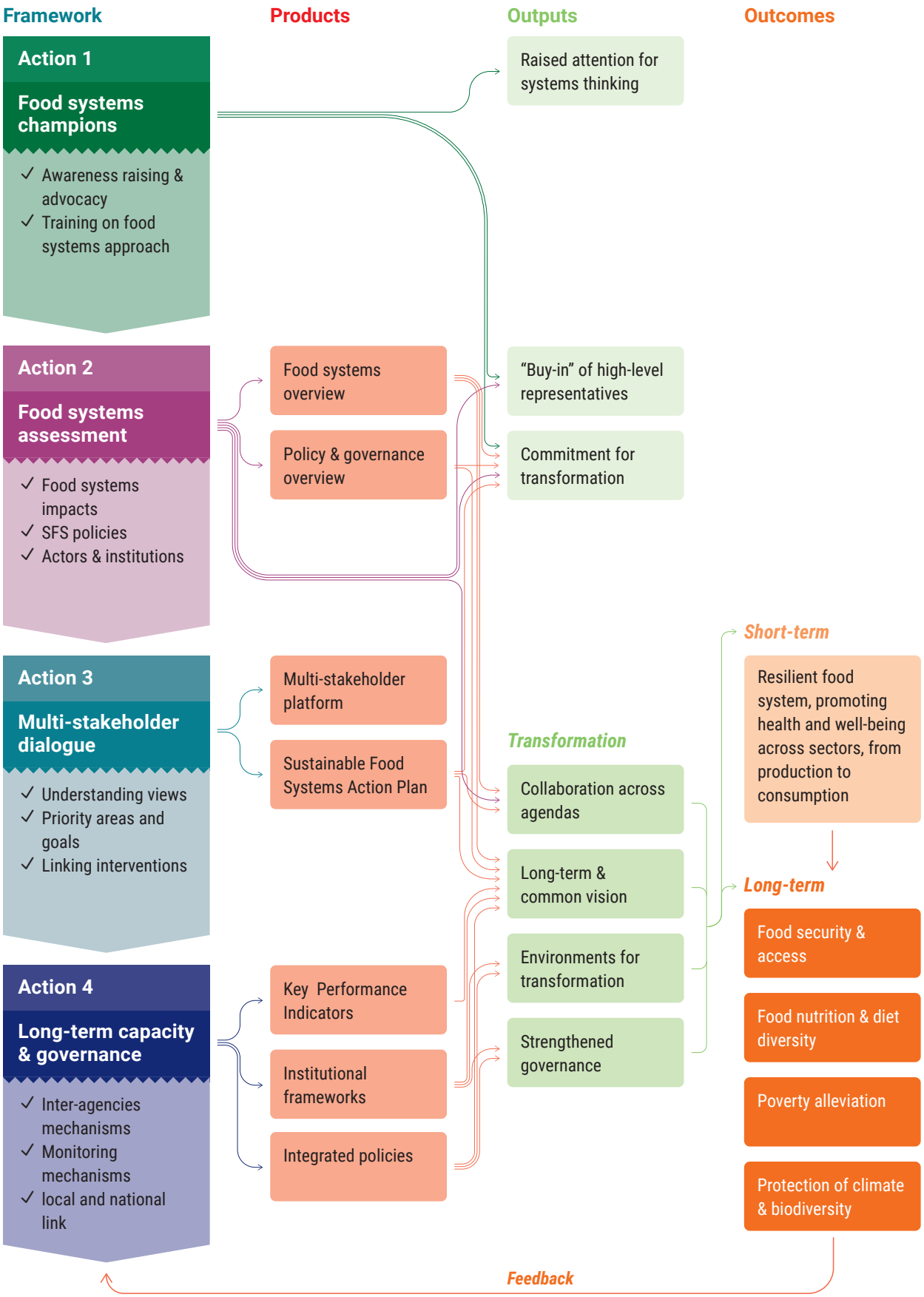
Around the world, countries, cities, and organizations are at different stages of developing strategies and setting their governmental agendas concerning food systems. In addition, there are differences in food systems challenges and priorities, so the **FS Framework needs to be used flexibly and should not be seen as a rigid sequence of steps**. In practice, depending on a country's or city's specific policy and development context, only certain actions may be required to achieve desired food systems outcomes, and several actions may be undertaken in parallel. However, governments that have limitations in policy coordination or comprehensive planning in the food and agricultural sector are recommended to cover all four actions of the FS Framework.

The FS Framework's actions, along with products, outputs, and outcomes, are illustrated on the next page, and presented in more detail in the following sections.

Box 2: The 2030 Agenda for Sustainable Development calls for systemic approaches

The Sustainable Development Goals have been designed to address all of the dimensions of sustainable development – economic, social and environmental – in the recognition that progress will need to be made on all of them together, and that policies for implementing them need to be based on a systemic understanding of the different goals and be designed as an integrated, coherent package managing for co-benefts and mitigating the effects of trade-offs (UNEP 2015b).

Figure 3: Four actions to build a food systems transformation



Action 1

Identify an individual or group of food systems champions and build momentum

Photo: rawpixel.com from Pexels

At first, shifting towards a more holistic approach to the food and agriculture sector may not appear so straightforward. Sectoral or silo thinking has been the standard pattern of policy development for many years. Therefore, at a city, regional, or national government level, there must be either an individual or a group that will champion the process, actively promoting this approach among their peers and across other organizations. This champion will be responsible for raising awareness of the need for change.

In many parts of the world, the momentum for food systems transformation is being built by local communities, civil society, research institutes, and business organizations. Such organizations are promoting more integrated assessments and multi-stakeholder dialogues, and creating SFS visions and roadmaps in a more inclusive way (→ please refer to chapter 5 / page 32 for some examples). In this context, they can actively engage and collaborate with policymakers, helping build systemic viewpoints and actions in policy planning and implementation.

The i**nvolvement and buy-in from the government** to adopt systemic change is valuable, given their task in setting the institutional and regulatory framework (→ Box 3 on the left). Champions in the government can be from any ministry or department, although, ideally, they would represent the ministries of agriculture, environment, and health (considering the three key outcomes of food systems). Also important is the "buy-in" of high-level representatives, as the adoption of a food systems approach will require reviewing key food and agriculture strategies and policies that are currently in place. **High-level political support is thus crucial,** sending an important signal to staff and citizens that the government is committed to solving present food systems challenges. Ideally, the commitment from this group should be publicized.

Overall, **food systems champions can undertake the following activities:**

- Raise attention and advocate for the need to adopt a different approach to food and agriculture policies — a food systems approach;
- build awareness and speak at public events to spread the message on the key benefits of systemic thinking; and
- organize trainings on the food systems approach within and across their institutions.

If there is little political will or high-level commitment to support the implementation of this FS Framework, it is recommended that the champion or initiator complete a meta-analysis (→ Box 5 / page 20) that can, in a practical way, frame current outcomes of the food system, including the financial and social costs of no action.

Box 3: The importance of formal government engagement in SFS Transformation

In some locations, planning for SFS actions is being led by various groups outside of the government (civil society, private sector, research groups, etc.). Lessons learned gathered by the RUAF Foundation suggest that "agro-food policy planning led exclusively by non-government groups risks that the results of policy planning are not sufficiently incorporated into the local policies, laws, budgets, and programmes, which will limit the impact of the plan" (Dubbeling and de Zeeuw 2007). At the same time, SFS planning led solely by the government gains little traction or ownership by stakeholders during its implementation. The suggestion is thus for a hybrid process — with planning that is **formally** supported and endorsed by the government, but also counts on the direct participation of other stakeholder groups in the different phases (→ Action 3 / page 22). Such cooperation can improve effectiveness, continuity, the harmonization of interests, and the adoption of a systemic approach.

Action 2

Conduct a holistic food systems assessment

It will be difficult to create any change within a food system without understanding the point of departure (i.e., **What is the present state of the food system today?**). Thus, it is strongly recommended to conduct an assessment using existing data while applying a **food systems lens**. Otherwise, the assessment will likely fail to identify the main food systems problems, causes, and solutions.

The assessment will provide the **basis of evidence for further discussions between stakeholders,** as well as the **foundation for a political agenda and dialogue within the government.** Overall, the assessment should strengthen understanding of the elements, linkages, drivers, and outcomes of the current food system.

The assessment should cover the following list of topics:

- Introducing and analysing food and agriculture impacts systemically (→ page 19), including environmental, social, health, and economic impacts, as well as clarification of the benefits of a more resilient and sustainable food system to the country or municipality.
- Analysis of policies and initiatives (→ page 21) that directly or indirectly influence food systems, including a review of enabling conditions to implement SFS locally and possible obstacles to overcome in the programme development and implementation process.
- Recommendations for possible priority / focus areas and policy responses (→ page 21). These will be further discussed within the government and stakeholders' group.
- Analysis of existing institutions within current food systems (→ page 21).

Within those topics above, the assessment should seek to understand:[10]

- The prevalent social and economic factors concerning food consumption and production, especially those that can drive negative food system outcomes;
- The interlinkages between the environmental, health, and social benefits within the food system;
- The prevalent patterns of food systems activities, from consumption (e.g., food waste) to production (e.g., efficiency and biodiversity aspects), and how this relates to food systems outcomes;
- The food systems actors — the people dependent on

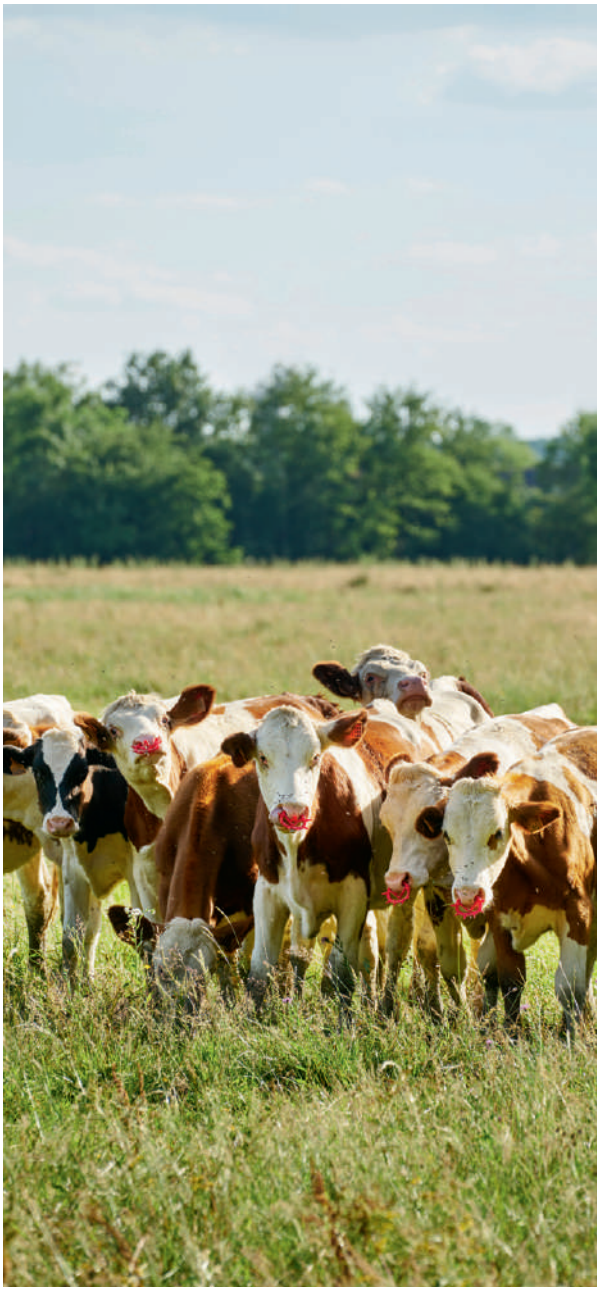


Photo: shutterstock.com

10 This assessment should be guided by a food systems approach. Please refer again to Figure 2 (illustration of food systems), if needed.

the food sector and those affected by food system unsustainability;

- The major trends influencing food systems (e.g., urbanization, supermarketization, food environments, climate change, food demand); and
- The hidden and unhidden aspects of food systems (externalities and environmental costs).

In order to generate the most comprehensive diagnosis of the food system, the study should not focus solely on food systems sub-sectors (e.g., by commodity or group of commodities such as cereal, dairy industry, fruit and vegetables) or on a narrow problem (e.g., agricultural production, undernutrition, food waste, land reform conflicts, or biodiversity loss) (Sonnino et al. 2014, as cited in Termeer, Drimie, Ingram, Pereira, and Whittingham 2018). Although many governments or actors tend to break agriculture and food systems into sub-sectors, which may seem practical due to each sector's specific structure, institutions, and relationships (UNEP, 2016), if the system analysis is fragmented, it will be difficult to examine the overall outcomes related to food security and nutrition or consumer behaviour and preferences, or to set a plan that can effectively address food systems' interconnected issues. → Box 4 below provides tips on moving beyond one-dimensional problem framing assessment.

In a second stage, once the comprehensive food systems assessment has been conducted (as suggested above), there may be a need to better understand the impacts of certain food sub-sectors or activities (e.g., agriculture, production and consumption of meat, water consumption footprint, etc.). → Annex 3 / page 51 provides examples of two UN Environment-hosted initiatives that will allow for more in-depth food systems analysis if needed.

→ *Introducing and analysing food and agriculture impacts systemically*

Presenting food systems facts side-by-side, possibly for the first time, will help highlight the interconnectedness of food systems. **The twelve key facts** in → Box 5 / page 20, should enable national and local governments to make the case for action by linking food systems impacts systemically. These facts are accompanied by suggested questions to assess each group of topics. Information can be collected through secondary data, interviews with experts, and consultation with stakeholders.

Box 4: Moving beyond one-dimensional problem framing and assessment

One of the key elements for implementing a food systems approach concerns the development of a system-based way to frame the problem (e.g., linking natural resource issues with agricultural production, health, capacity building, and poverty alleviation), rather than framing the problem too narrowly.

However, such a comprehensive analysis of food systems may be challenging for a government (e.g., the construction of too broad and vague problem frames; collection of data; management of different views). Suggestions to overcome these challenges include:

- Connect the framing of different issues in a jointly meaningful story that can generate guidance and commitment (Gray 1989, as cited Termeer *et al.* 2018). Often, the development of a "**theory of change**"[11] in the beginning of the assessment document can contribute to the quality of strategic thinking.
- Engage with your stakeholders in order to collect data from different sources. Start building a food systems database.
- Secure resources, including financial means, to effectively implement the assessment.
- Assign one organization experienced in this field (e.g., a local university or research institute) to coordinate the assessment.
- Through multi-stakeholder platforms (→ Action 3 / page 22), engage with stakeholders to address tensions regarding group objectives, understand contradictions, and always deal with diferences in a respectful manner (Clancy 2014, as cited in Termeer *et al.* 2018).

Adapted from Termeer et al. 2018; Dubbeling & de Zeeuw 2007

11 Hivos provides guidance and templates for theory of change development through its "Advocacy Toolkit: People centred advocacy for a more sustainable food system" (Hivos and IIED 2018).

Box 5: Twelve key facts for a national or subnational food systems assessment[12]

1. **Per cent of malnourished and / or overweight / obese people, prevalence of lifestyle and diet-related diseases such as diabetes (nutrition / consumption)**
- What is the current food and nutrition situation and how many of the food-insecure / malnourished people depend on the sector for their livelihood and / or access to food? Who represents the most affected groups?
- What do diets look like? How do dietary preferences affect food systems outcomes?

2. **Agricultural land-use statistics: food or industrial crops, abandoned farms, degraded land, etc.**
- What is the nature and extent of land use? Is there expansion or contraction of the agricultural area?
- What is the situation regarding land degradation? How are crop yields compared to similar regions / potentially attainable yields? How is pasture land being used?

3. **Agricultural water use: irrigation, water used for what per cent of crop value**
- Is water being used sustainably and efficiently in irrigation and food processing?
- Are groundwater levels monitored? Is there potential for expansion of irrigated areas?

4. **Figures on smallholder farmers and small and medium enterprise (SME) involvement in the supply chain (for domestic or international markets)**
- Are smallholder systems profitable and are they included in dynamic domestic and / or international supply chains?
- Do agriculture and food SMEs and smallholders have access to finance?

5. **Dominant players in the supply chain, including formal and informal markets: inputs, producers, commodity traders, food companies, retailers**
- How are markets (food access) organized? What is the share of supermarkets and out-of-home consumption in total expenditures?
- How much food is sold in informal wet markets?

6. **Food losses in the supply chain and / or food waste**
- How much food loss and food waste occurs? Which is more prevalent?
- What is happening to food waste, food residues, and human excreta?

7. **Figures of food produced for own consumption compared to total**[13]
- What is the share of imported or exported food in the total food production?
- Where is food being transported from and how (specifically for local governments)?

8. **Figures on use of agricultural inputs**
- Do smallholders have access to inputs (per cent women vs. per cent men)? Are inputs subsidized?
- How do fertilizer efficiency rates compare to best practices for the region?

9. **Figures on environmental pollution**
- What are the overall environmental impacts: GHG emissions, nutrient losses, pesticide emissions, soil and water quality?

10. **Productivity statistics and forecasting of key commodities**
- What are key commodity forecasts?
- Are there significant yield gaps to be highlighted?

11. **Figures on agri-food sector externalities**
- What is the estimated biodiversity loss due to food production?
- How much is being spent on health services through the treatment of non-communicable diseases resulting from food consumption habits, and those directly related to agriculture (e.g., pesticides)?

12. **Figures on major trends over time (e.g., urbanization, migration, climate change)**
- What are major changes / trends (urbanization, migration, climate change, etc.) and how do they affect food systems?
- What is the trend in diets over the last 10—20 years? What are the expectations for the future? What is the share of livestock products in diets?

Adapted from: UNEP 2008; Dubbeling and de Zeeuw 2007; FAO 2017; UNEP 2016

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12 FAO (2017) also describes a framework of questions to assess food security and nutrition, which can complement the one presented in Box 5.

13 It is important to note that, on a local or national level, the food production system and the food consumption system rarely coincide completely. Some of the food produced might be exported, while some of the food consumed is imported (UNEP 2016).

→ *Analysis of policies and initiatives*

Identifying and evaluating existing policies[14] and fiscal instruments such as subsidies, as well as initiatives, that affect (directly or indirectly) food systems outcomes (positively or negatively) is a key aspect of the scoping study. → Box 6 on the right should guide the policy and initiative review process.

At this stage, it is critical to remember the following considerations:

- Do not focus solely on agriculture sector policies. Food systems are a very cross-cutting concept. Food-related aspects can be covered by different institutions and policy domains (e.g., education, employment, health, industry, finance, public procurement, labels, etc.);
- There may be perverse and unintended consequences of agricultural subsidies on producers, the supply chain, and consumers;
- Depending on the type of governmental structure, national policies may have a higher or lower influence on the local political domain;
- On a national scale, many policies are connected to international commitments established by the country (e.g., 2030 Agenda, Paris agreement, Convention on Biological Biodiversity, World Trade Organization Agreements, CODEX, trade agreements, etc.);
- Try to identify possible conflicts and potential overlaps of the prevailing policies and interventions; and
- When evaluating a policy, try to understand potential outcomes in the short, medium, and longer term.

→ *Analysis of existing institutions*

Evaluate institutions and bodies that are linked to food systems management, by assessing the mandate and values influencing their views on sustainable food systems and their related actions, policies, and regulations (Dubbeling & de Zeeuw 2007).

14 Examples are agricultural policies, health regulations, land-use norms and zoning, environmental policies, development plans, poverty alleviation strategies, food security schemes, nutrition education and food supply programmes, economic development and marketing policies, etc. (Dubbeling & de Zeeuw 2007).

Box 6: Policy review

An assessment of the existing policies and initiatives should include the following:

1. Stock-taking of existing policies and initiatives
- What are the main policies and related instruments that govern food systems activities?
- What kinds of environmental regulations are in place? How are they implemented and enforced?
- Which subsidies are in place? What is the tax regime? Are there import and export tariffs?

2. Scope of the main relevant policies
- What are their specific policy objectives and target groups? What challenges do they address?
- How are the different policies interlinked?
- How do they relate to international / regional agendas or agreements?

3. Evaluation of the policy effectiveness
- To what extent are these policy measures implemented / enforced?
- Do those policies respond to current food systems needs?
- To what extent do policies incorporate the five principles of the food systems approach to policy-making?
- Are input subsidies preventing the uptake of sustainable agriculture practices? Are subsidies for specific crops impacting diet diversity for consumers?

4. Discussion of potential revision and measures
- What are the actual and potential effects (positive and negative) of the different policy measures on food systems, currently and possibly in the medium to long term?
- What are the conflicts and / or complementarities between sector objectives and environmental protection, socioeconomic / food security objectives?
- Are there conflicts and overlaps of the prevailing policies and interventions?
- What change is needed to reduce eventual conflicts and exploit possible synergies? How can the sector better contribute to rapidly increasing the intake of a nutritious and safe diet among those affected by food insecurity and malnutrition in the short and long terms?

Adapted from: UNEP 2008; Dubbeling and de Zeeuw 2007; FAO 2017; UNEP 2016

Action 3

Initiate a multi-stakeholder process for dialogue and action

Multidisciplinary collaboration and enhanced dialogue are keys to building consensus for change and a joint vision towards sustainable food systems. Therefore, an important stage in improving food systems policymaking processes is **establishing a permanent multi-stakeholder platform**. This platform contributes to the food systems assessment (based on Action 2), helps develop a plan of action, provides further advising, and helps implement the necessary measures for SFS transformation (→ examples of such measures in Annex 4 / page 52), including monitoring and following up on results. See → Box 7 below for a set of principles to follow when creating a multi-stakeholder group.

As part of the application of a systemic approach, this platform will allow the government to understand different goals and viewpoints from the variety of actors and institutions involved in food systems. Through this type of dialogue, politically sensitive issues that were previously uncomfortable (for example nutrition and livelihoods), can be tackled and consequently become less polarizing. The platform could take various forms, such as a food systems roundtable, a foodlab, or a food policy council (→ Chapter 5 / page 32 for examples).

More tips for managing different objectives among varying institutional arrangements (Dubbeling and de Zeeuw 2007) include:

- When preparing for meetings, try to find out what may facilitate or hinder the engagement of certain

Box 7: Principles for catalyzing sustainable food systems action when initiating a multi-stakeholder process[15]

Principle		Discussion
1	**Actively involve stakeholders**	Stakeholders across food systems need to be represented and actively participate in developing coordinated SFS policies and actions. Consensus-based participatory approaches to policy development are essential.
2	**Develop shared understanding**	Facilitate and share understanding of current and future functioning of food systems. Robust mapping and assessment of food systems under investigation supports shared understanding and identification of potential priority areas for action. Acknowledging the major trade-offs or differences in stakeholder priorities, while taking both bio-physical and socioeconomic factors into account, assists in developing long-term change in food systems behaviour.
3	**Encourage and incentivize interconnected decision-making**	Understanding of the interconnectivity of actions in the food systems and the impacts of decision-making across production, consumption, and nutrition encourages food systems thinking and action. This results in opportunities for increased dialogue across stakeholders and develops better understanding of possible cause and effect across the system.
4	**Utilize robust evidence to inform decision-making**	For stakeholder dialogue to be effective, meaningful, and fair, it should be underpinned by science-based evidence. This can be complemented as necessary by traditional knowledge. For action to be effective and measurable, it needs to be grounded in evidence-based decision-making processes.
5	**Prioritize action-oriented approaches**	Keeping discussions focused on specific, measurable, achievable, realistic, and time-bound (SMART) actions are necessary to create real change. Stakeholders stay motivated to participate in transformative processes when they see decision-making resulting in real change.

15 Adapted from UNEP 2015a, unpublished. Available on request from the authors.

Figure 4: Food systems main stakeholders

categories of actors and stakeholders group. The assessment in Action 2 will help with this.

- During meetings, be aware of the different interests of all participants, in order to manage the negotiation process.
- Identify an effective facilitator with relevant experience.

Food systems actors currently represent the largest group of natural resource managers in the world. When it comes to sustainability in the system, they are critical in both creating the problems and implementing the solutions (UNEP 2016). As illustrated in Figure 4 above, the multi-stakeholder platform should gather stakeholders who are not only involved in the production and consumption of food (for example, farmers, processors, distributors, retailers, and consumers), but also those who tackle the impacts and consequences of food systems (for example, international organizations, civil society, research institutes, public officials, and regulators from various areas such as environment, health, agriculture, trade, and education), without forgetting to engage the financial sector.

The participation of "marginalized people" is also necessary for fostering sustainable food systems (Hospes and Brons 2016, cited in Termeer et al. 2018). Such people (i.e., smallholder farmers, women, fishermen, indigenous communities, etc.) need to be empowered in order to contribute to positive transformation (UNEP 2016). These groups often lack access to the requisite skills and knowledge required for active and effective participation in policy planning. In developing countries, financial incentives may be a means to create more engagement and participation (Dubbeling and de Zeeuw 2007). Simultaneously, civil society organizations should be encouraged to participate in transforming food systems, as they play a crucial role in empowering and giving a voice to vulnerable groups (Termeer et al. 2018) (→ see case study from Zambia in chapter 5 / page 32).

→ *Discuss the food systems assessment*

The food systems assessment developed in Action 2 should be presented and used to guide discussions within the multi-stakeholder platform. This will allow government representatives and stakeholders to:

- Openly discuss potentially controversial findings of the assessment in a structured and constructive manner;

- Provide different inputs, including more data, that will improve the food systems assessment;
- Enhance their understanding of the food systems around them, including their own role in improving the system, and actions they can make;
- Create a common understanding about the main food systems issues and impacts;
- Increase awareness of the need to promote sustainable food systems; and
- **Facilitate the development of joint action in support of the transition towards SFS (very important!)**.

→ Develop an action plan for sustainable food systems

The creation of an Action Plan for Sustainable Food Systems (Action Plan for SFS) by the government and food systems stakeholders is a significant step, because it **establishes an official governmental mechanism for presenting a food systems agenda and trajectory for the food and agriculture sector.**

An Action Plan for SFS will connect existing country policy areas that impact or are impacted by food systems activities (see Figure 5) to support local or national government in moving beyond simple siloed interventions to an integrated and comprehensive multi-stakeholder political effort. Moreover, the Action Plan should create a joint vision concerning the expected sustainable food systems outcomes to be achieved (long-term vision), with a clear timeframe upon which stakeholders agree. At the same time, it should specify ways for managing short- and medium-term necessities and change. (Dalal-Clayton and Bass 2006). Other benefits include:

- Showing the how—by clarifying a plan of action, among different actors and types of interventions;
- In some cases, clarifying what resources are required to reach the goal;
- Supporting the continuation of food systems thinking, across different sectors;
- Enhancing enabling environments for the sustainable food systems transformation; and
- Supporting countries to meet targets and international commitments related to SFS.

The Action Plan for SFS can have different forms and legal implications, depending on the country (e.g., a joint announcement, a guideline document, or a governmental directive, for example an EU Directive).

Whatever its form, the Action Plan should be coherent with the results of the food systems assessment (Action 2) and discussions undertaken within the multi-stakeholder platform.

» Select priority areas

The selection of priority areas for the Action Plan for SFS should be based on each country's development needs and specific conditions, considering the following:

- Try to select **triple-win areas—those that positively impact health, environment, and profitability**—based on in-depth analyses of expected outcomes. As mentioned earlier, one of the key aspects of the food systems approach concerns the analysis of trade-offs (considering environmental, social, and economic impacts) and prioritizing the best triple-win solution for society. Where integration cannot be achieved, trade-offs need to be negotiated among food systems actors (Dalal-Clayton and Bass 2006).
- **Identify gaps** and areas yet to be covered and in need of improvement. For instance, in many cities or countries, food and agriculture policies have historically given priority to food production, without addressing the importance of nutrition.
- Some governments may initially prefer to limit their focus to a certain number of key issues, selecting areas that are most likely to bring about "quick wins". This can help to build momentum, as stakeholders may lose interest in the process if they do not see tangible results in the short term. Nevertheless, any focus on quick wins should be in the context of a systems-wide plan with medium-to-long-term objectives and goals.
- Priority areas may change as the Action Plan undergoes continuous improvement over the years.

» Define objectives and targets

Define easy-to-understand objectives and targets, as this should help engage various stakeholders, such as marginalized groups and the general public. Moreover, the targets need to be verifiable (**SMART — Specific, Measurable, Achievable, Relevant, and Time-bound**) so they can provide a basis from which to undertake future monitoring and evaluation (→ Action 4/page 27). If targets cannot be easily tracked, they cannot be communicated on an ongoing basis to the food systems actors. The business sector in particular needs to be aware of new or changing targets throughout this process, as this may require changes in their production processes (UNEP 2008).

» Select policies and interventions

A key aspect of a successful Action Plan for SFS (→ see Box 8 below) is the description of how the objectives and targets will be met (e.g., **which actions will be implemented**) and the explanations of different responsibilities within the government and stakeholder groups (e.g., **who is responsible for what**[16]). An Action Plan should optimize local skills and capacity both within and outside government (Dalal-Clayton and Bass 2006).

Policies and interventions should be selected based on how well they support the agreed-upon objectives and targets (UNEP 2008). A policy and instrument mix for an Action Plan for SFS can be quite varied (→ examples of policy actions in Annex 4 / page 52). At this stage, it is very important to **break silos** and integrate strategies at national or local levels. These will be, for instance, programmes on poverty reduction, climate change, sustainable development, and food security. The Action Plan for SFS also offers an opportunity to support governments in the implementation of conventions and international agreements, such as the 2030 Agenda (→ Box 9 on the right) and the Paris Agreement. **See → chapter 5 / page 32 for some examples of Action Plans for SFS at the city and national levels.**

Box 8: Characteristics of a successful action plan for SFS

The action plan must:

- ✓ Be based on a food systems approach;
- ✓ Establish a long-term vision and be built on consensus;
- ✓ Connect existing policies and efforts, as well as contribute to national and international commitments;
- ✓ Demonstrate national or local commitment to food security and environmental issues;
- ✓ Promote inter-ministerial or inter-secretariat and multi-stakeholder partnerships and ownership; and
- ✓ Be built on appropriate participation and representation.

Box 9: The cross-cutting element of the 2030 Agenda

The 2030 Agenda covers a broad range of issues in a cross-cutting way, meaning policy efforts for the achievement of a target from one goal, if implemented in a holistic way, will also benefit the accomplishment of at least one other target (most likely more) from a different goal. In other words, policy strategies that address single goal outcomes are unlikely to be successful. For example, doubling agricultural productivity (Target 2.3) could jeopardize the achievement of sustainable and resilient agriculture (Target 2.4), unless the two are implemented together (UNEP 2015b). A recommendation is to identify policies that have positive impacts on several goals.

» Approve the Action Plan for SFS

Seeking official government approval of the Action Plan will raise the profile of the process. The level of this approval depends on the local context. Wherever possible, it would be preferable to have the Action Plan for SFS approved by various secretariats or ministries, such as the local / national parliament or cabinet. This will contribute to the goal of **mainstreaming food systems themes in all government policies** aligned with the multi-dimensional characteristic of interventions (UNEP 2008). Additionally, such approval may result in the sharing of responsibilities, including human and financial resources, among different bodies.

Photo: shutterstock, Trueffelpix

16 Ideally, each actor should include the actions in which they are involved in their own annual plans and budgets (Dubbeling and de Zeeuw 2007).

Figure 5: Action Plan for SFS connecting different policy areas and actors

Action 4

Strengthen institutional capacity for food systems governance in the long term

At this point in the FS Framework, consensus has been achieved, an Action Plan for SFS has been developed, and its implementation has begun. However, for the Action Plan to effect transformative change in the long run, **the governance of the food system must be addressed.** The World Bank states that there is a strong causal relationship between good governance and better development and policy outcomes (World Bank Group 2019). See → Box 10 below for the meaning of governance.

Action 4 is meant to institutionalize systems change in order to avoid returning to the "old ways" of doing things during the implementation of policies and interventions (e.g., avoid silo thinking and short-term visions). The objective is to empower public institutions to guide the management of food systems towards long-term sustainable outcomes, from environmental, economic, and health perspectives.

→ *Create a mandated mechanism to improve institutional arrangements and frameworks*

Action 3 highlights the importance of building multi-stakeholder consensus and the need to transform the food system through an Action Plan. Action 4 looks to formalize consensus into **inter-ministerial committees or mechanisms**. These committees can bring together all relevant governmental ministries (agriculture, environment, finance, health, education, etc.) and become a platform where governmental policies, laws, regulations, and programmes are continually reviewed, improved, and implemented.

Box 10: Governance

Governance includes the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them (World Bank Group 2019).

Box 11: DEFRA – Merging ministries

The Department for Environment, Food and Rural Affairs (DEFRA) of the United Kingdom is a government department responsible for policies related to environmental protection, food production, and agriculture. It was created in 2001 after the Ministry of Agriculture, Fisheries and Food (MAFF) was partially merged with the Department of Environment, Transport and the Regions (DETR) to better address food and the farming industry, the rural economy, animal disease and welfare, and sustainable development issues. The scope of the DEFRA programmes tends to be more oriented towards sustainable food production, thus falling short of the needed systems approach called for in the FS Framework, which also includes consumption and public health. Nevertheless, the merging of two governmental departments demonstrates a good example of policy agenda integration (GOV.UK.).

The intention at this point is to continue applying a holistic approach to problem-solving and policy implementation, while avoiding the dominance of single departments and siloed-thinking (→ Box 13 / page 28). Consequently, within the public sphere, it is recommended to initially form mandated committees. In the long term, dedicated food systems institutions could be created and / or existing ministries and institutions could be merged, depending on the institutional context.

The merging of ministries involved in food systems policymaking into a single ministry would help to ensure cohesiveness in policy formulation and efficiency in governance. Any merger should be for the sake of cohesion and must not result in the reduction of power of an important food systems political institution in favour of another (e.g., undermining environmental conservation efforts in favour of agribusiness interests through the merging of those two ministerial agendas).

Today, there are a few examples of partial food systems integration, such as the Department of Environment, Food, and Rural Affairs in the UK (→ Box 11 above) and the Ministry of Food and Environment in Denmark (→ Box 12 / page 28). Beyond the public sphere, **an institutional framework should be set** and ideally include the following components (UNEP 2008):

- The inter-ministerial committee at the governmental level, and a coordination mechanism between natio-

Box 12: The inter-ministerial mechanism approach of the Danish government

In 2017, the Danish government established an **Advisory Board** for food, meals, and health, composed of the Ministries for Environment and Food, Health, Children and Social Affairs, Education, and Senior Citizens. Together, they give recommendations on how Danes can improve their food habits, which are further incorporated into the government's strategy for food, meals, and health. Within this strategy, the Danish government has recently set up an **Innovation Partnership** with participants from public authorities, businesses, health organizations, universities, etc., to promote the development of healthier, tastier products at more favourable prices, marketable both in domestic and export markets (MFVM.DK).

nal and local levels;

- A coordination mechanism for government agencies and other stakeholders to participate in the development, implementation, and monitoring of the Action Plan for SFS and its related policies and / or interventions (ideally the multi-stakeholder platform created in Action 3);
- A mechanism to ensure effective societal participation and transparency along the entire process, such as public consultations and communication activities; and
- The policy basis for the implementation and monitoring of the Action Plan for SFS at national or local levels.

Coordinating the process within the government, in particular managing negotiations on the selection of priority areas and SFS policies, is a considerable challenge. Therefore, appointing a strong lead agency or coordinating committee is essential. In most cases, the Ministry of Agriculture or the local Department of Agriculture have been seen as the central leaders of food and agriculture policies and interventions. Nonetheless, it is important to remember that food systems are complex in nature, so partnership arrangements among various ministries and policy domains should be encouraged throughout the whole process in order to avoid fragmented decision-making. The → Box 13 on the right further describes the challenges a government should consider.

→ *Integrate local and national SFS efforts*

It is important for governments to integrate local and national polices and efforts for sustainable food systems, to improve the coherence of interventions. The following are some suggestions on how this integration can be achieved:

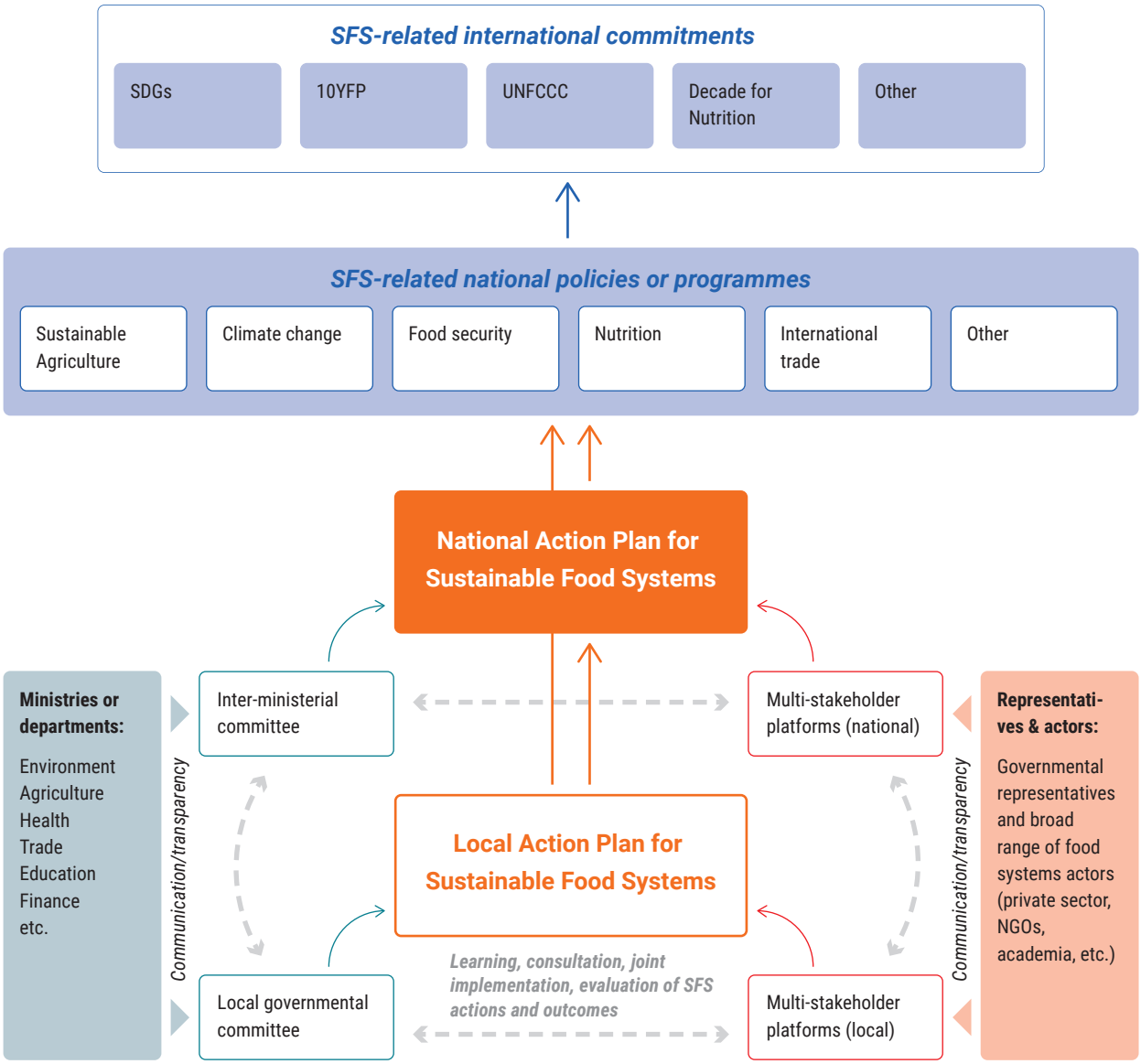
- **Decentralization of Action Plans for SFS.** National governments can require local governments to create local action plans for SFS, to respond to and align with overall country visions and priorities, and also to conduct institutional changes that embrace mechanisms of collaboration (within and between the two levels) and policy reforms (→ Figure 6 / page 29). Capacity building should be provided to local actors, following the FS Framework.
- When the food systems transformation and development of an Action Plan for SFS is only undertaken at one level of government, a mechanism that ensures dialogue and consultation between local / national

Box 13: Challenges concerning governance and institutional arrangements for a food systems approach

A study conducted on food governance arrangements and the application of a more holistic approach in South African SFS policies identified the following challenges or causes of failure (Termeer et al. 2018):

- Despite the holistic approach that was applied in the framing of the policies, the implementation phase reverted to one-dimensional framing of food problems.
- The predominance of single departments to implement the policy led to difficulty in breaking the silos and stimulating interactions among different food systems bodies.
- Allocation of government budget per sector prevented the emergence of joint projects.
- There was an absence of dialogue through multi-stakeholder platforms.
- Insufficient attention was paid to monitoring food systems policy outcomes.
- There was a lack of adequate resources to drive actual change (human and financial resources).

Figure 6: Example of an institutional arrangement that includes local and national governments



governments should be created. This can be done by identifying and engaging key food systems actors of one level to participate in the multi-stakeholder and/or intra-governmental meetings of the other level. Another option is the planning and organization of regular roundtables of dialogues between the two levels, to seek alignment of efforts and vision.

→ *Monitor progress towards sustainable food systems*

The monitoring and evaluation of progress towards sustainable food systems provides accountability for those parties and stakeholders involved and highlights the achievements and merits of the collaborative actions undertaken for food systems transformation. In addition, monitoring and reviewing the FS Framework's actions will allow institutions to better adapt to a complex environment of changing social, economic, political, and climatic conditions (Termeer et al. 2018). The progress should be monitored on two levels:

- **Process:** to ensure continuous improvements in the governance of food systems in the medium-to-long term, based on a food systems approach.
- **Outcome:** to show progress towards more diverse and sustainable food consumption and production, considering food systems outcomes.

To ensure transparency it is recommended that any results from this assessment be widely publicized.

» *Monitoring achievements towards improved governance (the process)*

Monitoring process will assess the progress with which countries or cities are establishing good conditions for policymaking and implementation (Arndt, et al. 2015). The process can be monitored at any phase. Monitoring is essential to maintain progress and ensure that all stakeholders are aware of the current phase and are actively engaged (Dalal-Clayton and Bass 2006). Some key messages:

- Good governance is not exclusive to developed countries.
- Significant improvements in governance can and do occur even over the relatively short period of a decade.
- Demonstrating improved governance of food systems can help governments and stakeholders attract new investments, as investors increasingly require proof of good governance arrangements.

In order to help policymakers and stakeholders with monitoring, the FS Framework developed a **Reference Checklist for a food systems approach in policymaking and implementation** (→ Annex 1 / page 45). The checklist covers different actions of the FS Framework. Process quality matters and denotes the application of continuous systemic thinking throughout the different phases. Some of the checklist's questions were based on findings from the implementation of holistic governance in South Africa (Termeer et al. 2018). The content on multi-stakeholder platforms is extracted from the Food Policy Council Self-Assessment Tool developed by Calancie et al. (2017). The principles applied include the five principles for a food systems approach to policymaking (see chapter 3), as well as good governance principles such as inclusiveness, accountability, and transparency.

Reference checklists are effective when discussed not only by the policymakers but also with food systems stakeholders.

» *Monitoring achievement towards improved outcomes*

After an initial assessment is complete and an Action Plan for SFS has been developed, with broad support from the public and other food systems stakeholders, a set of **Key Performance Indicators (KPIs)** should be identified. As the framework of KPIs will be linked to the interventions and policies for sustainable food systems contained in the Action Plan, its selection will vary by country or city.

Photo: Pexels, Christina Morillo

Below are some recommendations that should be followed when developing this framework. The KPIs should:

- **Assess food systems outcomes.** They should cover the multiple dimensions of the transformation process towards food and nutrition security, as well as sustainable and resilient agri-food systems (University of Bergan et al. 2014). For example, initiatives on the sustainable production of food should also measure improvements in aspects of consumption, such as health and sustainable behaviour. (Please refer to chapter 3 for the food systems definition and approach.)
- **Link to existing indicators.** Indicators selected to measure progress towards SFS should be, as much as possible, in line with existing national indicator frameworks (e.g., from umbrella or cross-cutting policies or programmes). This helps to harmonize information, enhances existing efforts for data collection on food systems, and gives more credibility to the final analyses. Analysis of the SFS interventions' outcomes, combined with analysis of other cross-cutting policies (such as poverty alleviation, economic growth, education, trade, etc.), allows policymakers and stakeholders to develop a wider picture of their progress towards addressing different food systems challenges.
- **Support reporting to other international commitments, such as the 2030 Agenda.** Countries are generally requested to, voluntarily or compulsorily, report their progress towards the international commitments they have adopted (e.g., Paris Agreement, 10 Years Framework of Programmes on Sustainable Production and Consumption, Milan Urban Food

Photo: UN

Policy Pact, etc.). Consequently, it is advisable to adjust, select, or create national or local frameworks of indicators in a way that supports their efforts to comply with those international commitments. The 2030 Agenda represents today's most important global commitment to achieving a better and more sustainable future for all, in an integrated way. The Agenda provides a comprehensive framework of 17 goals, 169 targets, and **various indicators** to officially monitor global progress towards achieving sustainable development (considering economic, social, and environmental dimensions). Many of these indicators can be used by countries or cities to monitor the outcomes of their food systems policies and interventions. See Annex 2 for suggestions for indicators.

- **Be developed through collaboration with different food systems actors.** A common challenge with monitoring and indicator selection involves the availability of data. Many countries, mainly low-income ones, have minimal or no access to food systems data. In other countries, relevant data exists but is not collected through one "food systems data system". Throughout the food value chain, many private sector companies develop impact assessments (such as LCAs) that can generate knowledge for the creation of food policy indicators and further monitoring. Similar studies are also being conducted by research institutes, and many are specializing in consumer behaviour change. Based on a food systems approach, data should also include information from health institutes (e.g., hospitals or insurance companies), education systems (e.g., school programmes), economic institutes, and smallholder associations. Encouraging collaboration among food systems actors will foster information sharing and discussion as a means to collect data, understand what already exists, and suggest methods for recording information (e.g., creation of an official food knowledge system).

→ *Promote training and capacity building*

In order to achieve success in implementation of the FS Framework, awareness raising and training on systemic thinking about food systems should be provided at several stages of the policymaking process, and to different target groups.

It is especially important to educate and train government staff on using a food systems lens: what it involves, what are its characteristics, how it can be implemented through the application of this FS Framework, and what are the consequences of not carrying out a food systems approach—the cost of inaction. Training will provide staff with the necessary tools and skills to be more effective in their roles as decision makers.

Likewise, engagement of other actors is crucial for implementing the FS Framework. They will also need to be equipped with the capacity to use a food systems lens and understand the role they play in support of sustainable food systems.

5. Case studies at national and local levels

This section offers eight case studies that provide insight into how the principles and actions discussed in this document have been partially implemented in practice. It also presents suggestions for improvement.

Photo: Lena Ha / Shutterstock.com

The following case studies exemplify some of the principles and actions within the food systems domain that were discussed in this document. They highlight good practices and suggested recommendations from on-the-ground initiatives.

The examples vary from public-sector-led initiatives to others led by civil society and the private sector. As the food systems approach becomes more ingrained in institutional terms, UN Environment and partners expect to collect new case studies (mainly within the governmental sphere) to share with the international community.

Changing food systems through inclusive multi-stakeholder dialogue: The Zambian Food Change Lab

Photo: Hivos, Sven Torfinn

Maize is the dominant crop in Zambia, in terms of both production and consumption, and levels of crop diversity on Zambian farms tend to be very low. The country's maize-centric food system is a primary driver for persistently high levels of poverty and malnutrition, and it increases vulnerability to drought, pests, and disease. With a 40 per cent stunting rate in children under five and nearly half of the population experiencing seasonal hunger, growing a wider variety of nutritious crops is required to improve rural livelihoods, food security, and farmers' resilience to climate change.

Hivos,[17] together with a consortium of Zambian civil-society organizations, led the creation of a multi-stakeholder initiative to define and co-create strategies for the **diversification** of agriculture. The **Zambian Food Change Lab** is an inclusive, multidisciplinary, multi-stakeholder process that aims to engage all actors, especially those from more vulnerable and underrepresented groups.

The initiative brings together women and men in the Zambian food system—including smallholder farmers, farmers' organizations, policymakers, youth, the private sector, civil society, and the media—to jointly identify and analyse problems, build stakeholder coalitions, generate ideas, and test these innovations on the ground. To truly foster understanding, participants are encouraged to immerse themselves in the living reality of the problems they are trying to collectively solve.

In addition to using available scientific evidence, Food Change Lab participants are challenged to share knowledge through alternative methods, by "listening and responding" emotionally and intuitively. This approach is based on the belief that fomenting change cannot depend on data alone.

To tackle these interconnected issues, different working groups were formed early in the process. With the goal of agricultural diversification in mind, these groups identify strategies, including policy advocacy, to better support smallholder farmers. For instance, the youth group is developing learning centres for food production, as well as lobbying and advocating for sustainable diets in Zambia. A second group organized a two-day national symposium on agriculture in September 2017, bringing together smallholder farmers, farmers' organizations, the Ministry of Agriculture, and other key stakeholders.

Agricultural diversification has since been enshrined as a key pillar of Zambia's 7th National Development Plan (2017–2021), and platforms such as the Zambian Food Change Lab enable smallholder farmers to give feedback to the government on its implementation.

Lessons learned and recommendations

Diversifying agriculture and tackling malnutrition in Zambia is a complicated and lengthy process that has been on the agenda for several years. The Change Lab methodology is a tool to make food governance more inclusive and effective. It is a recommended model to be used for similar inclusive multi-stakeholder dialogues around local or national food system issues in different jurisdictions. While any given stakeholder could initiate such a process, governments (city councils, national and sub-national governments) should eventually assume a stake in ownership to ensure the adoption and continuation of inclusive food policymaking.

Effective and long-term changes also rely on the government's revision of existing food systems policies to become more holistic and inclusive. Therefore, a food systems transformation would further benefit from a formal government engagement mechanism to review outdated policies based on the outcomes and decisions of platforms such as the Food Change Lab.

17 Hivos is a non-governmental organization based in the Netherlands that promotes the view that "necessary changes should spring from communities themselves—from people at the base of society." For more information, see: https://www.hivos.org/

Using consumption as a driver for food systems transformation: The Nordic way

A major transformation has occurred in the Nordic food system over the past 15 years. It all started with the New Nordic Kitchen Manifesto, a document developed and signed by 12 Nordic chefs. The Manifesto outlines 10 principles for creating a sustainable, novel, and innovative regional food culture. Shortly after the Manifesto took root, the Nordic Council of Ministers, an intergovernmental agency promoting cooperation, saw major potential in promoting local, national, and regional foodscapes. At first, seed funding was provided to personify the Manifesto's principles, followed by investments in high-risk projects aimed at turning the New Nordic ideology into reality. From 2009 to 2013, a research project at the University of Copenhagen formulated a New Nordic Diet and measured its effect on food acceptability, behaviour and learning skills in children, disease prevention, and the environmental impact of diets.

The New Nordic Diet is recognized by the World Health Organization for having similar effects on health and the environment as the Mediterranean Diet, including protective effects against cardio-vascular diseases and type 2 diabetes, along with lower greenhouse gas emissions (WHO 2018).

This unconventional example of a soft policy intervention has led to positive knock-on effects, such as a new openness to food diversity; growth in the sales of organic, local / seasonal, and artisanal food; increased interest in promoting old / rare Nordic crop varieties and livestock breeds; and new forms of innovation in the food industry. Public-private partnerships were essential for increasing buy-in and the legitimacy of the New Nordic ideology. Additional policies influencing the shift towards more sustainable food systems include strengthening the technical skills of local food producers, developing national food service sector strategies, and considering food as a part of the creative economy.

These efforts complemented other forms of regional cooperation addressing human and planetary health. From 2013 to 2016, the Nordic Council of Ministers established an initiative to understand food waste, resulting in the establishment of common guidelines for date labelling and food distribution. The issue of food waste facilitated cross-ministerial cooperation between ministries of food and agriculture, environment, health, and trade. Successful governmental initiatives are also dependent on cooperation with consumer organizations, research institutions, civil society organizations, NGOs, and the food industry.

Photo: Norden.org

The Nordic Plan of Action, the Nordic Monitoring System, and the Nordic Nutrition Recommendations are regional policies taking a holistic approach to combatting unhealthy diets and lifestyles. Their main goal is to ensure that most Nordic citizens are eating according to the recommendations and to democratize sustainable food. Monitoring systems ensure future policies are evidence-based and that countries can benchmark against one another. This feeds into the development of national dietary guidelines. The Nordic Nutrition Recommendations also acknowledge the environmental impact of diets, especially those containing excessive amounts of animal-sourced foods.

Lessons learned and recommendations

Shifting food culture from the status quo requires multiple tactics, a shared vision, and an integrated approach. Shared Nordic values form the foundation for long-term cooperation. A 2018 analysis—The Solutions Menu: A Nordic Guide to Sustainable Food Policy—identified that Nordic food policies are successful because they are evidence-based, democratic, progressive, open, holistic, and sustainable. The Solutions Menu was published by the Nordic Food Policy Lab, an initiative under the Nordic Council of Ministers. The Lab collects and shares innovative regional, national, and municipal policies, and facilitates the exchange of new ideas about the future of food policy.

Developing an integrated food policy: The city of Ede in the Netherlands

The city of Ede is located in the centre of the Netherlands. With 120,000 inhabitants, Ede faces significant food system challenges, as with any modern Dutch city. Ede was one of the first cities in the Netherlands to tackle these challenges, through an integrated food policy that focuses on six key challenges: healthy people, a healthy food environment, sustainable consumption, short food chains, a robust agri-food sector, and a food systems governance approach. The key to this initiative involved establishing a dedicated food team with its own budget and an Alderman on Food, thus generating a political champion and political momentum from the outset.

In 2012, using a participatory process, the city council developed a vision document for the city (Visie Ede 2025). Food became one of the 10 key issues for the municipality. The overall goal for Ede is to ensure healthy and sustainable food for all of its citizens. By 2015, the municipality of Ede had developed the Visie Food!, outlining its comprehensive food vision and strategy.

The Ede food team actively seeks connections and opportunities for cooperation with other policy departments, such as economy, employment, education, and health, which is a key principle of the FS Framework. The economic and societal aspects of the strategy address the Framework's other principles: including food consumption as a driver, facilitating platforms of collaboration, and addressing emerging economic and social trends alongside environmental concerns.

Ede started simply, with a few activities based on current knowledge and dialogue between the food team, municipal departments, and other partners. These activities focused on the development of existing food businesses, Ede's food profile, awareness among inhabitants and tourists, food education projects, and knowledge exchange among civil society, businesses, and inhabitants. The municipality cooperates with strategic non-governmental partners in the region to realize the objectives of the food vision.

To monitor the progress and results of the Visie Food!, the municipality reports on the individual programme objectives through an online public dashboard. The tailor-made food dashboard combines information on all selected indicators to monitor progress within the six food policy themes. By embedding the food dashboard into the newly developed general municipal dashboard,

Ede demonstrates how improving the local food system is as important as other municipal issues. Though the programme is in its early stages, there have been measurable impacts in Ede. Seventy per cent of the city's residents are familiar with the Ede and Food programme. Various partnerships have also been formed within the municipality, contributing to an integral vision anchored in Ede's society.

Lessons learned and recommendations

Ede's successful approach to integrated food policy was well-supported, with a team (of approximately four FTE), a fixed budget line, and the first Alderman on Food. The implementation of the food vision was embedded in the policies of other programmes and departments, each with their own food actions, budget, and monitoring tasks. In terms of monitoring, SMART objectives for simple monitoring were established (SMART = specific, measurable, acceptable, realistic, and time-bound). It is important to clarify objectives and activities of the programme to make more efficient use of the team's time and to enhance assessment. In the monitoring framework as elaborated by Ede, minimal focus is given to process indicators. It is recommended to include such aspects in further policy monitoring.

Additionally, communication and participation were vital to the success of the Visie Food! programme. Attention and visibility are needed to strengthen the role of citizens, societal organizations, farmers, and entrepreneurs. It is also recommended to create a communication strategy for this purpose and to communicate impacts and results both internally and externally, to the council and citizens.

Changing food systems through evidence-based policymaking in Senegal: Insights from Biovision

Changing Course in Global Agriculture (CCGA) is one of Biovision's[18] core programmes aimed at improving food security. Through this programme, a participatory approach is used to apply a system-dynamic tool for influencing policies towards sustainable food systems.

As Senegal was planning for a nationally integrated growth strategy, called "Plan Sénégal Emergent (PSE)", Biovision collaborated with the Senegalese think tank IPAR[19] to establish a CCGA module. The country's relatively stable political situation and an existing partner network supported this decision. The PSE presented several challenges, including fostering socially and ecologically sustainable food security, inclusive rural development, and a national decentralization process. Addressing these multidimensional targets through coherent interventions required systemic thinking. A participatory multi-stakeholder process combined with the integration of a system-dynamic planning tool, the iSDG model,[20] was established by CCGA, following the four key actions of the FS Framework:

1. Establish a group of food systems champions within government and build political momentum: CCGA was embedded in the Direction Générale de la Planification et des Politiques Économiques (DGPPE) of the Ministry of Economics and Planning (MEFP). As a first step, a joint technical advisory committee (TAC) of model experts was created. Other consultation fora between civil society organizations, farmers' organizations, and private sector representatives were also included in the programme's multi-stakeholder approach.
2. Conduct a holistic food systems assessment: The iSDG model was adapted to the Senegalese context through participatory workshops with the national statistics agency. This process of participatory data collection and modelling built a common understanding of the complexity and interlinkages of the food system and enabled the comparison and evaluation of different scenarios.
3. Initiate a multi-stakeholder process for dialogue and action: Numerous meetings and workshops facilitated unprecedented policy dialogues at different levels and among policymakers, governmental officials, technicians, scientists, academia, and others. Questions, scenarios, analyses, and results of the system-dynamic tool were discussed in these platforms.
4. Improve food systems governance: The CCGA project sensitized and capacitated stakeholders for a more integrated, evidence-based approach to policymaking as a key requirement to improve food systems governance.

The main achievements of CCGA Senegal to date include:

- Building of a national Senegalese iSDG model with a simple modelling interface for the MEFP;
- Institutionalization of the approach by training national experts and the development of a permanent curriculum on system-dynamic modelling at the national statistics school (ENSAE in Dakar);
- Utilization of the model by both the planning and agricultural ministries for various policy analyses. The policy outputs of the model were included in a strategic government document, the "Stratégie Nationale Faim Zéro Sénégal"; and
- Building of a regional iSDG pilot model for the county of Diourbel to test the model for sub-national use and strengthen the capacities of the local county governments.

Lessons learned and recommendations

Biovision and its Senegalese partners are convinced this approach is well-suited to transition towards more sustainable food systems with inclusive and effective governance. Still, there is a lot to learn to make this process more participatory and accessible for external actors. After time, the model became "locked-in" with one ministry, which resulted in less participatory debate around potential interventions to model. This approach is also challenged by the turnover of trained governmental staff who are capable and willing to operate the model.

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18 Biovision is a non-governmental organization based in Switzerland that promotes the transformation towards sustainable ecological agriculture, on a practical and political level, based on a holistic and scientific approach: https://www.biovision.ch/

19 For more information, see: http://www.ipar.sn/?lang=fr

20 iSDG (formerly called T21) is a system-dynamic simulation model that was developed by Biovision's partner organization, the Millennium Institute (MI). iSDG accounts for the interlinkages of the SDGs and takes into account the social, economic, and environmental spheres, with the aim of simulating integrated and long-term policy scenarios: https://www.millennium-institute.org/isdg

The contribution of Food Policy Councils to the emergence of SFS strategies: The case of Toronto[21]

During the 1980s, Canada's largest city was facing risks of increasing hunger and poverty, declining food quality, and environmental degradation (MacRae 1994). With a call from community groups and engagement from civil servants, the Toronto City Council established the Toronto Food Policy Council (TFPC) in 1990, with a major focus on the systemic causes of hunger and food insecurity. The TFPC is a subcommittee of the Board of Health and advises the Toronto City Council on policies and programmes that will increase food security for the city's residents. It connects diverse people from the food, farming, and community sectors and provides a forum for action across the food system.

In 2001, the Toronto City Council endorsed a Food Charter, recognizing Toronto's commitment to realizing the United Nations Covenant on Social, Economic and Cultural Rights, which includes "the fundamental right of everyone to be free from hunger", and outlines a series of actions for the city to improve food security. Food security is also embedded in the city's Official Plan, which recognizes the importance of rural-urban linkages, and in the city's Environmental Action Plan, which acknowledges how urban agriculture and local food procurement can help the city achieve its environmental goals. In 2010, Toronto Public Health endorsed a food strategy for the City of Toronto and created a new team to implement the priorities articulated in the strategy. Current initiatives include a food retail analysis, a healthy corner store pilot project, a community food sector procurement pilot, and an urban agriculture action plan. The TFPC now has an expanded mandate to act as the community reference group for the food strategy.

The City of Toronto has passed numerous policies and developed programmes related to improving the food system over the past 20 years. These include:

- A community gardens policy with the goal of creating a garden for every ward in the city and a programme in the Parks and Recreation Department for supporting community garden development;
- Support for the establishment of farmers markets in city parks and at civic centres;
- A food and beverage sector specialist on staff to support new and existing food businesses;
- Creating and providing financial support to a student nutrition programme;
- A local food procurement policy with the goal of 50 per cent local food purchased by City Divisions;
- A Toronto Food Strategy, endorsed with financial support dedicated for implementation;
- A food truck policy;
- A Regional Food and Farm Action Plan, endorsed with financial support dedicated for implementation; and
- A Toronto Agriculture Programme created to support scaling up of urban agriculture.

The TFPC continues to bring new policy ideas forward to the city, most recently illustrated by its advocacy for increased city support for urban agriculture, which resulted in the creation of the Toronto Agriculture Program and an urban agriculture steering committee chaired by the Deputy City Manager.

The City of Toronto also contributes staff time and financial resources to a regional economic development strategy for the food and agriculture sector: The Golden Horseshoe Food and Farm Action Plan.

Lessons learned and recommendations

A number of factors contributed to the success of Toronto's food policy activities: (i) Toronto Public Health's ongoing staff support and resources for the TFPC and Food Strategy implementation; (ii) embedding responsibility for the programme and activities across various City Divisions including Parks, Forestry and Recreation; Environment and Energy Division; Social Development; Administration and Finance, etc.; and (iii) drawing on the expertise of food system stakeholders to provide strategic advice and support for policy and programme implementation.

21 Extracted from Baker and de Zeeuw.

Integrating food security and nutrition initiatives into urban development plans: The award-winning Sustainable Lima Program

The Metropolitan City of Lima, with more than ten million inhabitants, recognizes the importance of food for preserving Peruvian tradition and culture, and promoting sustainable urban development. This may explain why in this urban centre, known as the gastronomy capital of Latin America, 90 per cent of the population prefers to buy food at traditional markets — retail markets and small neighbourhood shops. Lima's unique retail food environment, with diverse stores, is believed to have great potential for promoting healthy diets and fostering closer connections between producers and consumers. However, obsolete infrastructure and weak logistics in food supply chains, along with changing consumption habits due to overexposure to processed foods, are resulting in major food systems challenges. For example, in Lima today, two in three adults are obese. The city is witnessing rising rates of childhood obesity and anaemia, while food insecurity is a threat in the growing slums at the periphery of the city.

With growing attention to food security and nutrition in urban areas, the Food and Agricultural Organization of the United Nations (FAO) launched a pilot project on "Developing Sustainable Food Systems for Urban Areas" in December 2016. The project, known as NADHALI, selected Lima as one of the cities for implementation, along with Nairobi and Dhaka. The ultimate goal was to establish a foundation for a systemic approach to addressing urban food security and nutrition challenges.

The NADHALI project included three main activities: (i) the development of the Rapid Urban Food Systems Appraisal tool — RUFSAT — aimed at identifying hotspots and creating holistic evidence for prioritizing food systems intervention; (ii) the establishment of multi-stakeholder food systems platforms for informing municipal decision-making and facilitating effective and inclusive food systems planning and problem solving; and (iii) the development of a food strategy that links food systems analysis to governance (FAO 2018b).

With the leadership of the Economic and Social Development Department of the Lima Municipality, NADHALI facilitated the shift from a sectorial to a systemic approach to food. Starting with the integration of food systems and food security within the Sustainable Lima Program (Programa Lima Sostenible), the project began raising awareness at the municipal level, providing training to more than 50 city officials, and promoting the participatory food systems planning approach.

At the outset, the project established the Food Liaison Advisory Group (FLAG), a multi-stakeholder platform that attracted the interest of more than 30 experienced institutions — including civil society, academic, non-governmental, private sector, and national government representatives. Within FLAG, several organizations with a long history of working towards pro-sustainable food systems were engaged, including the Urban Agriculture Platform and the Peruvian Association of Gastronomy. Also involved was the Healthy Eating Platform, which was previously responsible for the Peruvian Healthy Eating Act (2017), which promoted healthy and nutritious food in Peru's shops and schools.

The NADHALI project supported the linkages between these institutions and platforms, allowing for the first phase of a participatory food planning process connected to existing municipal initiatives and development plans. As a milestone, FLAG agreed on a Carta Alimentaria (Food Charter), a multi-actor commitment aimed at improving access to healthy food for all, while reducing food waste and preserving natural resources (FAO 2018a).

The institutionalization of FLAG as a Food Policy Council is currently under discussion, together with the idea of establishing a Food Security section within the Municipality. Based on the food systems hot spots identified through RUFSAT and validated through FLAG, the Lima Municipality initiated the process of developing the Lima Food Strategy and action plan, aligned with the National Food Security Plan 2015-2021. The action plan — which includes actions towards enhanced urban agriculture and small-scale fishing, improvement of retail supply markets and waste reduction, improvement of consumption habits, and preparation for emergency due to natural disasters — is being developed with the intention of integrating it with other Lima development plans.

The city of Lima signed the Milan Urban Food Policy Pact (MUFPP) in May 2018 and received the second monetary prize for the category "Challenging Environment" within the MUFPP Award 2018. The monetary prize will be used for transferring the good practices from Lima to other MUFPP cities. Likewise, with the support of FAO, the Lima Municipality initiated an outreach program with small cities and towns throughout Peru to promote urban food systems planning at the national level, while also strengthening urban-rural linkages.

Recognizing the role of the private sector in sustainable food systems: Food system modelling in Mexico and farmer family nutrition in Kenya

The global and local food systems in many countries perform poorly, not just in nutrition and health, but also with regard to environmental and social externalities. The role of industry in transforming food systems is poorly understood, and alignment between industry and civil society or governmental stakeholders is often inadequate. To address this challenge, the World Business Council for Sustainable Development partnered with EAT, a Swedish non-profit organization[22], to create FReSH. FReSH is an initiative to accelerate transformational change for sustainable and healthy food systems.

FReSH commissioned an approach for food systems modelling and ran a pilot study for the Mexican food system. As a result, industry stakeholders better understand the position they could have in the larger context of food systems interventions. FReSH member companies are able to identify hotspots in the Mexican food system where private sector interventions can make a difference.

The food system model is built in three steps. The first step describes the food system by means of a map with social, economic, and ecological variables. Arrows illustrate the interactions between the variables. For instance, an increase in food crop prices improves farmer profitability, but reduces consumer demand. The second step involves the identification of hotspots. Several external databases contain performance indicators for food systems. These databases are used to better understand the functioning of a food system and facilitate the identification of hotspots or failures. For example, such analysis would suggest that the issue of widespread obesity in the Mexican food system is a hotspot. In the third step, an interactive workshop brings together relevant stakeholders. Together, the stakeholders analyse the hotspots and system map, and identify relevant leverage points or interventions for stimulating a more sustainable food system.

Nestlé, a member company of FReSH and participant in the Mexico multi-stakeholder workshop, implemented a similar approach to enhance farmer nutrition in Kenya (Farmer Connect). FAO, along with the Kenyan government, local governments, and civil society organizations, developed a Country Programming Framework (CPF) that set priorities for the food system in Kenya. Emphasis is given to reducing poverty and hunger through a sustainable, commercially oriented, and competitive agricultural sector. Nestlé assessed the regional food system of coffee farmers in Kenya, which had been identified as a key supplier with poor socioeconomic conditions. The assessment revealed that up to 70 per cent of farmers and their families experience food shortages for three months per year, while simultaneously having poorly diversified diets lacking proteins and certain micronutrients.

Photo: Neil Palmer (CIAT)

Nestlé hired a nutrition specialist to examine the dietary diversity of coffee-producing families and facilitate training. Aligned with the Kenyan CPF and in collaboration with parastatal organizations, a range of initial interventions were planned that are expected to improve the quality of life for farmers in the short term. These include, among others, farmer training on nutrition, promotion of intercropping, the provision of good quality seeds to establish kitchen gardens and livestock to improve nutrition security, and training on sanitation and provision of soap where required. More than 85 per cent of farmers set up kitchen gardens after receiving training, suggesting they understand the benefits of improved nutritional performance for their families. These farmers are also mixing food groups when preparing meals, resulting in a measurable improvement of their household dietary diversity scores.

Lessons learned and recommendations

The National Government of Kenya now includes the promotion of best nutritional practices in their country's Vision 2030. The impact of the project could be further strengthened if farmers started to breed small livestock (chickens, goats) or practice aquaculture to improve the quality of their diet with some animal proteins.

22 For more information, please see https://eatforum.org/.

Financing SMEs for improved nutritious food systems: The case of Africa

Support to small and medium-sized enterprises (SMEs) in Africa is needed, as they create around 80 per cent of Africa's employment (World Economic Forum 2015) and local agri-food businesses can produce more nutritious and sustainable foods. However, African SMEs face considerable constraints regarding access to finance (Garrett 2018), as investing in agri-food companies in Africa is often considered high risk by banks, and lending often involves high transaction costs for SMEs. Given that, the Global Alliance for Improved Nutrition (GAIN),[23] in collaboration with various donors, has created two programs: the Marketplace for Nutritious Foods and the Nutritious Foods Financing Program.

The Marketplace for Nutritious Foods provides technical and financial support and fosters networking for SMEs in Kenya, Mozambique, and Rwanda. Its Community of Practice (CoP) is a network of local entrepreneurs, investors, and institutions working in agriculture and nutrition. CoP members explore solutions, share lessons learned, and exchange knowledge about market opportunities and policy changes to improve the quality and delivery of nutritious foods (GAIN 2018). This allows government actors and companies to interact and link to strategic objectives from health and agriculture ministries. Through an Innovation Accelerator, technical and financial support is provided to SMEs that produce nutritious foods. It invites companies to submit business ideas within the agriculture value chain that are investible and good for nutrition. During the program's first phase (2013-2017), USD 3.03 million of investment was disbursed to businesses; these funds leveraged USD 1.6 million (53 per cent of the invested funds) in private sector investment. Over a period of four years, the grantees produced over 34 million servings of low-cost, nutritious foods. To reach low-income consumers' needs, the Marketplace supports SMEs to be better businesses (through standard business development services) and to develop products that appeal to and can be afforded by low-income consumers.

GAIN's new Nutritious Foods Financing Program catalyses private sector finance to help scale up locally

Photo: GAIN

produced nutritious foods in Africa. In Kenya and Tanzania, financing needs for investments to improve the delivery of nutritious food can amount to USD 5.7 billion (Elmer and West 2018). Currently, GAIN facilitates multi-stakeholder engagement processes, designs nutrition investment metrics, evaluates capital markets, and makes available financing instruments capable of attracting investment capital. This will contribute to reducing malnutrition through: i) alleviating constraints and creating incentives for large and small companies to focus on and invest in nutrition; ii) building on and maintaining the medium- and long-term sustainability and predictability of resource flows to the nutrition sector; and iii) creating an opportunity for investors seeking new themes, such as nutrition, that improve development outcomes (Schofield 2018).

Lessons learned and recommendations

Policies and financing mechanisms must support businesses, especially SMEs, to provide nutritious and safe foods for sustainable food systems. Such mechanisms could take the form of selective taxes and subsidies, marketing controls, food quality regulations, or mechanisms that promote innovative financing. Lessons learned from the implementation of these mechanisms will provide a foundation for scaling up and channelling greater flows of capital into business efforts that are conducive to the production and consumption of nutritious foods (Schofield 2018).

23 The Global Alliance for Improved Nutrition (GAIN) was launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with partners, GAIN aims to make healthier food choices more affordable, more available, and more desirable. GAIN aims to support and advise governments, businesses, and development partners as they build and mobilize food and nutrition plans to advance nutrition outcomes. GAIN's purpose is to improve nutrition outcomes by improving the consumption of nutritious and safe food for all people, especially the most vulnerable.

References

Akenji, L. and Chen, H. (2016). A Framework for Shaping Sustainable Lifestyles. Nairobi, Kenya: United Nations Environment Programme.

Apps.who.int. GHO | Visualizations | Indicator Metadata Registry. Available at: http://apps.who.int/gho/data/node.wrapper.imr?x-id=1. Accessed 7 August 2018.

Arndt, C., et al. (2015). 2015 Indicators of Regulatory Policy and Governance: Design, Methodology and Key Results. OECD Regulatory Policy Working Papers, No. 1. Paris: OECD Publishing.

Baker, L. and de Zeeuw, H. Urban Food Programmes: An Overview. Available at: https://www.ruaf.org/sites/default/files/2.%20Urban%20food%20policies.compressed.pdf

Benoît, Catherine, ed. (2009). Guidelines for Social Life Cycle Assessment of Products. United Nations Environment Programme.

Burlingame, B. and Dernini, S. (2019). Sustainable diets: Linking Nutrition and Food Systems. Wallingford: C.A.B. International. Available at: https://www.cabi.org/bookshop/book/9781786392848.

Calancie, L., Allen, N.E., Weiner, B J., Ng, S.W., Ward, D.S., and Ammerman, A. (2017). Food Policy Council Self-Assessment Tool: Development, Testing, and Results. Preventing chronic disease, 14, E20. DOI: 10.5888/pcd14.160281.

CIAT. Sustainable Food Systems. Available at: https://ciat.cgiar.org/about/strategy/sustainable-food-systems/. Accessed 4 March 2018.

Dalal-Clayton, B. and Bass, S. (2006). A review of monitoring mechanisms for national sustainable development strategies. London: IIED. Report prepared for the OECD.

Dubbeling, M., and de Zeeuw, H. (2007). Multi-Stakeholder Policy Formulation and Action Planning for Sustainable Urban Agriculture Development. Working Paper Series 1. Leusden, The Nethelands: ETC Urban Agriculture / RUAF Foundation.

Dubbeling, M., Zeeuw, H.D., and Veenhuizen, R.V. (2010). Cities, poverty and food: multi-stakeholder policy and planning in urban agriculture. Practical Action Publishing.

Elmer, P. and West, E. (2018). Nutritious Food Financing Program: Investment Opportunities in Nutritious Foods Value Chains in Kenya and Tanzania. Global Alliance for Improved Nutrition. Available at: http://www.gainhealth.org/wp-content/uploads/2018/10/Report-iGravity.pdf.

Ericksen, P.J. (2008). Conceptualizing food systems for global environmental change research. Global environmental change, 18(1), 234-245.

Fanzo, J., Cogill, B., and Mattei, F. Technical Brief: Metrics of Sustainable Diets and Food Systems. Biodiversity International.

FAO (1996). Rome Declaration on World Food Security and World Food Summit Plan of Action. World Food Summit. Rome, 13-17 November 1996.

FAO (2009). Global agriculture towards 2050. Rome: Food and Agriculture Organization of the United Nations.

FAO (2010). Sustainable Diets and Biodiversity Directions and Solutions for Policy, Research and Action. Proceedings of the International Scientific Symposium, Biodiversity and Sustainable Diets United Against Hunger. FAO Headquarters, Rome: 3-5 November 2010.

FAO (2011a). Energy-smart food for people and climate. Issue paper. Rome: Food and Agriculture Organization of the United Nations.

FAO (2011b). Global food losses and food waste—Extent, causes and prevention. Rome: Food and Agriculture Organization of the United Nations.

FAO (2011c). Guidelines for measuring household and individual dietary diversity. Rome: Food and Agriculture Organization of the United Nations.

FAO (2012). The state of world fisheries and aquaculture. Rome: Food and Agriculture Organization of the United Nations.

FAO (2013a). SAFA: Sustainability Assessment of Food and Agriculture systems. Tool. Rome: Food and Agriculture Organization of the United Nations.

FAO (2013b). The state of Food and Agriculture. Food Systems for Better Nutrition. Rome: Food and Agriculture Organization of the United Nations.

FAO (2015). Food Waste Footprint and Climate Change. Rome: Food and Agriculture Organization of the United Nations.

FAO. (2017a). Leaving no one behind: Achieving gender equality for food security, nutrition and sustainable agriculture. FAO

Conference, 40th Session. Rome, 3-8 July 2017.

FAO (2017b). Strengthening Sector Policies for Better Food Security and Nutrition Results. Policy Guidance Series. Rome: Food and Agriculture Organization of the United Nations.

FAO (2017c). The future of food and agriculture — Trends and challenges. Rome: Food and Agriculture Organization of the United Nations.

FAO (2018a). Carta Alimentaria de Lima Metropolitana. Available at: http://www.fao.org/3/BU650es/bu650es.pdf.

FAO (2018b). The NADHALI project: Developing Sustainable Food Systems for Urban Areas: Piloting a holistic approach in NAirobi (Kenya), DHAka (Bangladesh) and LIma (Peru). Available at: http://www.fao.org/in-action/nadhali/en/.

FAO / Food for the Cities Programme. Need for sustainable and resilient City Region Food Systems. Available at: http://www.fao.org/in-action/food-for-cities-programme/approach/need-for-sustainable-and-resilient-crfs/en/.

Fao.org. 2.1.1 Prevalence of undernourishment | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/sustainable-development-goals/indicators/211/en/. Accessed 7 August 2018.

Fao.org. 2.3.1 Productivity of small-scale food producers | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/sustainable-development-goals/indicators/231/en/. Accessed 7 August 2018.

Fao.org. 12.3.1 Global food losses | Sustainable Development Goals | Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/sustainable-development-goals/indicators/1231/en/. Accessed 7 August 2018.

FAO / Urban Agriculture. FAO's Role in Urban Agriculture. Available at: http://www.fao.org/urban-agriculture/en.

FAO, WFP et al. (2012). The State of Food Insecurity in the World: Economic Growth Is Necessary But Not Sufficient to Accelerate Reduction of Hunger and Malnutrition. Rome: FAO.

Fischer, C.G. and Garnett, T. (2016). Plates, Pyramids, and Planets: Developments in National Healthy and Sustainable Dietary Guidelines: A State of Play Assessment. Food and Agriculture Organization of the United Nations and the Food Climate Research Network at The University of Oxford.

GAIN (2018). Marketplace for Nutritious Foods. Global Alliance for Improved Nutrition. Available at: https://www.gainhealth.org/programs/marketplace-for-nutritious-foods/.

Garrett, G. (2018). Investing in SMEs to improve the consumption of nutritious foods in Africa. Global Alliance for Improved Nutrition. Available at: https://www.gainhealth.org/knowledge-centre/investing-in-smes-to-improve-the-consumption-of-nutritious-foods-in-africa/. Accessed 30 August 2018.

Giljum, S., Burger, E., Hinterberger, F., Lutter, S., and Bruckner, M. (2011). A comprehensive set of resource use indicators from the micro to the macro level. Resources, Conservation and Recycling, 55(3), 300-308.

GOV.UK. Department for Environment, Food & Rural Affairs. Available at: https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs. Accessed 6 July 2018.

High-level Task Force of Global Food and Nutrition Security (2015). Compendium — Final Report Zero Hunger Challenge Working Groups.

Hivos and IIED (2018). Advocacy Toolkit: People centered advocacy for a more sustainable food system. Available at: https://hivos.org/assets/2018/06/advocacy_toolkit.pdf.

Hivos, IIED, and KRC (2016). Uganda Food Change Lab: Planning for the future food system of Kabarole district.

HLPE (2014). Food losses and waste in the context of sustainable food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome.

HLPE (2017). Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome.

Ingram, J., Ericksen, P., and Liverman, D. (2012). Food security and global environmental change. Routledge.

IPCC (2018). Global warming of 1.5°C. Switzerland: Intergovernmental Panel on Climate Change. Available at: http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

IPES Food (2015). The New Science of Sustainable Food Systems: Overcoming Barriers to Food Systems Reform.

IPES Food (2016). From Uniformity to Diversity. A paradigm shift from industrial agriculture to diversified agroecological systems.

Jennings, S., Cottee, J., Curtis, T., and Miller, S. (2015). Food in an urbanised world: The role of city region food systems in resilience and sustainable development. Report of the Food in an Urbanized World Conference, 4 February 2015.

Lifecycleinitiative.org. Life Cycle Terminology — Life Cycle Initiative. Available at: https://www.lifecycleinitiative.org/resources/life-cycle-terminology-2/. Accessed 7 February 2018.

MacRae, R. (1994). So Why Is the City of Toronto Concerned About Food and Agriculture Policy? A Short History of the Toronto Food Policy Council. Culture & Agriculture, 15, 15-18. DOI: 10.1525/cuag.1994.15.50.15

Meybeck, A., and Redfern, S. (2016). Sustainable value chains for sustainable food systems. In Joint FAO/UNEP Workshop on Sustainable Value Chains for Sustainable Food Systems. Rome, 8-9 June 2016. FAO/UNEP.

OECD (2001). OECD Glossary of Statistical Terms—Environmental Externalities Definition. Available at: https://stats.oecd.org/glossary/detail.asp?ID=824. Accessed 6 August 2018.

OECD (2017a). Policy Advisory Systems: Supporting Good Governance and Sound Public Decision Making, OECD Public Governance Reviews. Paris: OECD Publishing. Available at: https://doi.org/10.1787/9789264283664-en.

OECD (2017b). Systems Approaches to Public Sector Challenges: Working with Change. Paris: OECD Publishing.

One Planet Network. What is the 10YFP? Available at: http://www.oneplanetnetwork.org/what-10yfp. Accessed 6 April 2018.

One Planet Network. Sustainable Food Systems Programme. Available at: http://www.oneplanetnetwork.org/sustainable-food-system. Accessed 6 August 2018.

Schmidhuber, J. and Shetty, P. (2005). The nutrition transition to 2030: Why developing countries are likely to bear the major burden. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/WAICENT/FAOINFO/ECONOMIC/ESD/JSPStransition.pdf.

Schofield, D. (2018). Increasing funding flows to nutrition. Global Alliance for Improved Nutrition, Nutritious Foods Financing Program. Available at: https://www.gainhealth.org/wp-content/uploads/2018/06/Nutritious-Foods-Financing-Program.pdf.

Solon, M.M., Mink, P., Dernini, S., Bortoletti, M., and Lomax. J. (2019). The One Planet Sustainable Food Systems Programme as a Multi-stakeholder Platform for a Systemic Approach. In Sustainable diets: Linking Nutrition and Food Systems. Burlingame, B. and Dernini, S. (eds.). Wallinford: C.A.B. International. Available at: https://www.cabi.org/bookshop/book/9781786392848

Sustainable Food Systems Programme. Towards a Common Understanding of Sustainable Food Systems: Key Approaches, Concepts and Terms. Rome: Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/fsnforum/sites/default/files/files/155_understanding-sustainable-food-systems/Draft_SFS_Glossary_v22NOV2018.pdf

TEEB (2015). TEEB for Agriculture & Food: an interim report. Geneva: United Nations Environment Programme.

TEEB (2018). TEEB for Agriculture & Food: Scientific and Economic Foundations. Geneva: United Nations Environment Programme.

Termeer, C.J., Drimie, S., Ingram, J., Pereira, L., and Whittingham, M.J. (2018). A diagnostic framework for food system governance arrangements: The case of South Africa. NJAS-Wageningen Journal of Life Sciences, 84, 85-93.

The Danish Government (2018). The government's strategy for food, meals and health. The Ministry of Environment and Food. Available at: mfvm.dk. Accessed 15 November 2018

The Economics of Ecosystems and Biodiversity (2018). Measuring what matters in agriculture and food systems: a synthesis of the results and recommendations of TEEB for Agriculture and Food's Scientific and Economic Foundations report. Geneva: UN Environment.

UNEP (2008). Planning for Change. Guidelines for National Programmes on Sustainable Consumption and Production. United Nations Environment Programme.

UNEP (2012a). The Critical Role of Global Food Consumption Patterns in Achieving Sustainable Food Systems and Food for All: A UNEP Discussion Paper. Paris: United Nations Environment Programme, Division of Technology, Industry and Economics.

UNEP (2012b). Avoiding Future Famines: Strengthening the Ecological Foundation of Food Security through Sustainable Food Systems. Nairobi: United Nations Environment Programme.

UNEP (2014). Prevention and reduction of food and drink waste in businesses and households—Guidance for governments, local authorities, businesses and other organisations, Version 1.0. United Nations Environment Programme.

UNEP (2015a). National Round-Tables on Sustainable Food Systems—A Practical Guide to Getting Started. United Nations Environment Programme, unpublished publication

UNEP (2015b). Policy Coherence of the Sustainable Development Goals. A Natural Resource Perspective. An International Resource Panel Report. United Nations Environment Programme.

UNEP (2016) Food Systems and Natural Resources. A Report of the Working Group on Food Systems of the International Resource Panel. Westhoek, H, Ingram J., Van Berkum, S., Özay, L., and Hajer M.

UNEP (2017). The Emissions Gap Report 2017. Nairobi: United Nations Environment Programme.

United Nations (1997). Glossary of statistics, studies in methods. New York: United Nations.

University of Bergen, IDDRI, ESPA, Biovision Foundation, Millennium Institute (2014). Sustainable Development Goals and Targets on Food and Nutrition Security through Sustainable Agriculture and Food Systems in the Post-2015 Agenda.

Vanessa, A., Stefano, A., and Stanislao, A.A. Understanding the dynamics of Food Supply and Distribution Systems (FSDS).

WHO (2018). What national and subnational interventions and policies based on Mediterranean and Nordic diets are recommended or implemented in the WHO European Region, and is there evidence of effectiveness in reducing noncommunicable diseases? Available at: http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2018/what-national-and-subnational-interventions-and-policies-based-on-mediterranean-and-nordic-diets-are-recommended-or-implemented-in-the-who-european-region,-and-is-there-evidence-of-effectiveness-in-reducing-noncommunicable-diseases-2018.

World Bank Group (2019). Worldwide Governance Indicators. Available at: http://info.worldbank.org/governance/WGI/#home. Accessed 3 January 2019.

World Economic Forum (2015). Why SMEs are key to growth in Africa. Available at: https://www.weforum.org/agenda/2015/08/why-smes-are-key-to-growth-in-africa/.

World Health Organization. Global Health Observatory Indications: Indicator Metadata Registry. Available at: http://apps.who.int/gho/data/node.wrapper.imr?x-id=1. Accessed 7 August 2018.

Annex 1: Reference checklist for a food systems approach to policymaking and implementation

Engagement of actors on food systems transformation

Objective: to understand the level of buy-in and engagement from government and other stakeholders for transforming food systems. These questions can be applied in the beginning or throughout the transformation process.

1. What is the appropriate level of "buy-in" from the government, including support from high-level representatives, to implement the FS Framework?
2. What is the level of engagement of different food systems actors to implement the FS Framework?
3. What is the level of resistance to transformative change?
4. What is the level of understanding of the food systems approach to policymaking and implementation?

Food systems diagnosis

Objective: to analyse the level of system-based framing of problems, as opposed to one-dimensional framing. These questions consider the food systems approach definition and principles.

5. To what extent does the diagnosis go beyond sectoral problem framing to apply system-based problem framing (e.g., link natural resource issues with agricultural production, health and malnutrition / obesity, consumption habits and diet, capacity building, and poverty alleviation)?
6. To what extent does the assessment consider current food systems trends and challenges (e.g., climate change, urbanization, consumer food preferences, etc.), and consumption patterns as a driver of food systems impacts?
7. What is the level of assessment and identification of food systems actors (e.g., the people dependent on the food sector and those affected by food systems' unsustainability)?
8. What is the level of engagement of multi-stakeholder groups in the diagnosis discussions? To what degree was / is opposition addressed?

Food systems multi-stakeholder platforms

Objective: to assess the level and quality of multi-stakeholder engagement in policymaking and implementation, including monitoring. These questions can be applied as a survey or discussion guide to capture the perception of those involved in the multi-stakeholder platform. They consider good governance principles, such as inclusiveness, transparency, and accountability, and the principles of the food systems approach to policymaking and implementation.

9. Leadership — To what extent does the leadership promote an egalitarian or democratic environment, engaging participation from all members, valuing diversity and fair conflict management, and articulating vision and commitment to the group?
10. Inclusive council climate — What is the perception regarding shared power and decision-making, shared mission, conflict resolution, and a sense of cohesion?
11. Breadth of active membership — What is the range of stakeholders actively participating in the platform (including number of women vs. men, and other most vulnerable groups)?

12. Member empowerment — What is the degree to which members perceive being individually empowered to effect change (e.g., to influence policy and practice in their home agencies and in the community) as a result of their participation in the council?
13. Knowledge — What is the degree to which members are exposed to information about the food system and to each other's activities related to food systems?
14. Systemic approach — To what extent does the council show the capacity to combine perspectives, resources, and skills of groups of people and organizations?
15. Perceived impact — What are the food council members' perceptions of council-level accomplishments, or steps towards achieving the council's goals?

Action plan for sustainable food systems (content / development process)

Objective: to assess the degree to which the action plan embraces a food systems perspective. These questions consider the five principles for food systems policymaking and implementation. They can be additionally applied to SFS policies and interventions.

16. To what degree does the action plan state a clear long-term vision on sustainable food systems outcomes that is built on consensus?
17. To what extent do the interventions address different food systems issues, from consumption to production, and promote a systemic approach to tackle food systems problems?
18. What is the level of engagement of multistakeholder groups in action plan development and implementation? To what degree was opposition addressed?
19. To what extent does the action plan connect different policy fields by spanning boundaries, such as integrated programmes, coordination schemes, public-private partnerships, multi-stakeholder platforms, or integrated participatory analysis?
20. Is the action plan recognized as an official mechanism? What is the level of support received from government and stakeholders?

Institutional capacity and governance

Objective: to assess the degree to which the food systems approach is reflected in institutional terms and governance and addresses the challenge of fragmented siloed organizational structures. These questions consider food systems principles, specifically 3 and 4.

21. What are the institutional arrangements in place (e.g., mechanisms for inter-ministerial or inter-secretariat and multi-stakeholder participation)? How effective have they been in promoting a collaborative approach?
22. To what extent is policy implementation being tailored through different departments, secretariats, and / or ministries? If there is a leading department, what is its capacity to coordinate with others?
23. To what extent is the governance system more coherent and harmonized, better integrated and coordinated, and more inclusive?
24. To what extent is the budget allocated through the different food systems bodies?
25. What is the level of continuity of food systems thinking?
26. To what extent is the action plan being reviewed in collaboration with food systems stakeholders, information being shared, and lessons learned being undertaken?
27. To what extent are the institutional arrangements and governance being reviewed in collaboration with food systems stakeholders, information being shared, and governance improvements being undertaken?

Annex 2: Suggestions of Agenda 2030 indicators that can directly or indirectly support the monitoring of outcomes from sustainable food systems policies

Food systems outcomes	Agenda 2030 targets	Related indicators
Food security and nutrition	**Target 2.1:** By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	★ **Indicator 2.1.2:** Prevalence of undernourishment
	Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	★ **Indicator 2.2.1:** Prevalence of stunting (height for age <−2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age. ★ **Indicator 2.2.2:** Prevalence of malnutrition (weight for height >+2 or <−2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
	Target 2.3: By 2030, double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	★ **Indicator 2.3.1:** Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size ★ **Indicator 2.3.2:** Average income of small-scale food producers, by sex and indigenous status
	Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	**Indicator 2.5.1:** Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities; **Indicator 2.5.2:** Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction
	Target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	★ **Indicator 2.a.1:** The agriculture orientation index for government expenditures ★ **Indicator 2.a.2:** Total official flows (official development assistance plus other official flows) to the agriculture sector

★ Direct indicator

Food systems outcomes	Agenda 2030 targets	Related indicators
Food security and nutrition	**Target 2.b:** Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round **Target 2.c:** Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	**Indicator 2.b.1:** Agricultural export subsidies **Indicator 2.c.1:** Indicator of food price anomalies
	Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.	**Indicator 3.4.1:** Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
Environment	**Target 6.3:** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally **Target 6.4:** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	★ **Indicator 6.3.1:** Proportion of wastewater safely treate ★ **Indicator 6.4.1:** Change in water-use efficiency over time ★ **Indicator 6.4.2:** Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
	Target 8.4: Improve progressively, through 2030 global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	**Indicator 8.4.2:** Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	Target 12.1: Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries **Target 12.2:** By 2030, achieve the sustainable management and efficient use of natural resources	**Indicator 12.1.1:** Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies **Indicator 12.2.1:** Material footprint, material footprint per capita, and material footprint per GDP **Indicator 12.2.2:** Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	Target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	★ **Indicator 12.3:** Food Loss Index and Food Waste Index

★ Direct indicator

Food systems outcomes	Agenda 2030 targets	Related indicators
Environment	**Target 12.4:** By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	**Indicator 12.4.2:** Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment
	Target 12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	**Indicator 12.8.1:** Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.
	Target 12.A: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	**Indicator 12.A.1:** Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies
	Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	**Indicator 13.3.1:** Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula **Indicator 13.3.2:** Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions.
	Target 14.4: By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics **Target 14.6:** By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation **Target 14.7:** By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism **Target 14.B:** Provide access for small-scale artisanal fishers to marine resources and markets	★ **Indicator 14.4.1:** Proportion of fish stocks within biologically sustainable levels ★ **Indicator 14.6.1:** Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing ★ **Indicator 14.7.1:** Sustainable fisheries as a percentage of GDP in small island developing States, least developed countries and all countries **Indicator 14.B.1:** Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries

★ Direct indicator

Food systems outcomes	Agenda 2030 targets	Related indicators
Environment	**Target 15.1:** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	**Indicator 15.1.1:** Forest area as a proportion of total land area
	Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	★ **Indicator 15.3.1:** Proportion of land that is degraded over total land area
Socioeconomic	**Target 5.a:** Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	★ **Indicator 5.a.1:** Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure
	Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors	**Indicator 8.2.1:** Annual growth rate of real GDP per employed person
	Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	**Indicator 8.5.1:** Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
	Target 10.2: By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	**Indicator 10.2.1:** Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities
	Target 11.A: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	★ **Indicator 11.A.1:** Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city
	Target 16.7: Ensure responsive, inclusive, participatory and representative decision-making at all levels **Target 17.14:** Enhance policy coherence for sustainable development	**Indicator 16.7.1:** Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions **Indicator 17.14.1:** Number of countries with mechanisms in place to enhance policy coherence of sustainable development
	Target 17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries	**Indicator 17.16.1:** Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals

★ Direct indicator

Annex 3: Suggestions of additional methods for more in-depth analyses of food systems

Once you have conducted the comprehensive food systems assessment (as suggested in the Framework), you may find the need to better understand the impacts of certain food sub-sectors or activities (e.g., agriculture, production and consumption of meat, water consumption footprint, etc.).

Below are two methods for further in-depth assessment of food systems, from sustainability perspectives. They are complementary and both can support the analysis of trade-offs in decision-making processes and the construction of future scenarios within a food systems context.

a) Identification of sustainability hotspots

Evidence is growing about the benefits of applying Life Cycle Thinking (LCT) and Life Cycle Assessment (LCA) in decision-making and policymaking processes. LCT and LCA are assessments that support the identification of the potential environmental impacts with the greatest significance (called sustainability hotspots) through the life cycle of a product or system.

In LCT, data are typically qualitative (statements) or very general and available-by-heart quantitative data (Lifecycleinitiative.org), which can be used in a design brief or in an introductory discussion of policy measures. This type of assessment can be of special interest for developing economies, given the economic cost that an LCA may entail.

LCA is a deeper quantification of the analyses, where there is a "compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle".

Source: the UN Environment-hosted Life Cycle initiative.

b) Environmental costs and externalities — (in)visibility of nature in decision-making

An increasing number of governments are starting to consider the economic value of their biodiversity and ecosystem services, in order to integrate this information into their decision-making processes. Ecosystem services and biodiversity provide a number of benefits to the agriculture sector that are usually invisible to us (e.g., invisible ecological inputs to agriculture, such as freshwater provisioning, nutrient cycling, and pollination). While such services remain invisible, they are also becoming degraded. The environmental costs (externalities) of food systems are rarely included in food prices.

The Economics of Ecosystems and Biodiversity (TEEB) initiative supports governments to quantify the economic benefits provided by nature. The TEEBAgriFood initiative seeks to provide a comprehensive economic evaluation of the eco-agri-food systems complex, and demonstrate that the economic environment in which farmers operate is distorted by significant externalities, both negative and positive, and a lack of awareness of dependency on natural, human, and social capital. The study makes visible what is usually neglected, while acknowledging the monetary costs associated with the impacts of the agriculture sector on society.

Source: UN Environment-hosted TEEB Agri-food initiative

Annex 4: Examples of interventions to be included in an Action Plan for SFS

After reviewing the actions presented in this Framework (undertake a comprehensive assessment, establish a multi-stakeholder platform, develop the Action Plan for SFS, and enhance long-term governance), it is recommended to review the following list of key intervention examples. Such interventions could be an integral part of your Action Plan.

In terms of scope, these examples represent SFS interventions based on a country / local context. Some interventions suggested below would be best suited for the national level (e.g., fiscal interventions and advertising regulation) and some at the local government level (e.g., promotion of urban agriculture and local markets).

No single intervention is capable of transforming our food systems. On the contrary, it is **only through a set of different policies and regulations,** covering both upstream (e.g., incentives for more efficient production and supply chains) and downstream (e.g., reducing food waste) activities, and with a long-term vision, that a government will be able to transform certain food systems.

The golden rule for any policy is: **Keep in mind the five principles for a food systems approach to policymaking presented in this report (see chapter 3). Always think holistically!**

a) Examples of how to improve resource efficiency of food provision

Incentives for the uptake of resource-efficient and climate-smart production

Through the implementation of a number of coordinated policies, actions, and tools, governments can provide favourable conditions and incentives for promoting the adoption of more sustainable agriculture. More sustainable production practices can also serve to increase the inclusiveness of smallholder farmers. Smallholder farmers produce over 80 per cent of the food consumed in low-income countries. They often remain in poverty due to a lack of access to extension services, market information, or physical markets, as a result of insufficient infrastructure. Moreover, smallholder farmers mostly contend with issues of marginal high-risk environments and experience poor yields (TEEB 2015). Financial incentives can promote a shift to more sustainable practices.

With the improvement of rural infrastructure and relatively simple technologies, some quick and significant gains can be made in terms of **reducing pre- and post-harvest losses** in low-income regions (Lipinski et al. 2013; UNEP 2016, as cited in HLPE 2014a). This can further stimulate the uptake of more agro-ecological, climate-smart, and resilient production systems and technologies at the farm and landscape levels.

At the farm level, **payment for environmental services (PES)** can provide farmers with the critical financial incentives to invest in and manage new techniques for resource-efficient and sustainable agriculture. In many countries, PES programmes are used to encourage the conservation of ecosystems and forests, and to improve living conditions and incomes of people living in extreme poverty in rural areas. PES programmes also enhance well-being by increasing the farmer's skills and environmental and technical qualifications.

Environmental standards and regulations should be put in place to prevent negative externalities. Taxes on environmental impacts (nitrate leakages, water pollution from pesticides, pesticide exposure, GHG emissions, and so on) can be particularly effective.

Encouraging partnerships with the private sector is another fundamental intervention. The private sector can help develop capacity and create incentives for smallholder farmers and SMEs through their supply chains. For instance, private companies could pay farmers and fishermen for better management of natural resources, which would help smallholder farms and small agri-food businesses in developing countries invest in sustainable activities. Such activities may include improving water and energy-use efficiency in food storage and processing, and in other post-farm-gate activities (UNEP 2016).

Consumer engagement concerning healthy and sustainable production has also translated (although still on

a small scale) into economic incentives for farmers to produce more sustainably. Investing in the increase for this demand, combined with the establishment of more local markets for instance, can enhance this incentive and benefit overall food systems (see Section b, below).

Integrating finance into sustainable land use—an emerging topic

Governments should seek more collaboration with the financial sector, as they can include sustainability criteria in decision-making processes concerning the provision of loans and investments. Banks and financial institutions are becoming increasingly interested in funding a shift towards more sustainable agriculture and land management. These shifts are occurring specifically in developing countries, where most of the deforestation associated with the production of commodities such as palm oil, soy, beef, timber, cocoa, and rubber takes place. These "zero net deforestation" commitments are being adopted by a growing number of agribusinesses (e.g., Unilever, Mars, Nestlé, and Carrefour) and financial institutions (e.g., BNP Paribas, Rabobank), and opening the door for a different approach to agricultural production. However, to move from commitments to implementation, it is imperative that public funding is leveraged to "de-risk" private finance towards "zero net deforestation" agricultural production. De-risking in this context means taking away some of the perceived and real credit risk, as well as costs for smallholder farmers, supply chain companies, and financial institutions. These actions are related to switching to sustainable agricultural commodity production that is decoupled from deforestation, climate, and biodiversity impacts.

Improving food supply and distribution

Due to changes in food systems over the last century, many food items are now produced and distributed in complex food nets and lengthy supply chains. Food supply and distribution (production, handling, storage, transport, processing, packaging, wholesale and retail sales, etc.) are very complex schemes and should not be treated as isolated activities. On the contrary, governments should see them as part of a single, highly connected system if they want to be successful in meeting their population's food needs for the next decade (Vanessa et al.) while reducing environmental impacts and increasing the resilience of cities and ecosystems.

Globally, more than 50 per cent of the population now lives in cities, implying that at least 50 per cent of food is consumed in cities and that large quantities of nutrients are transported to cities. In 2030, 80 per cent of our population will reside in urban areas. This indicates that cities and regions are crucial nodes of our food systems, and where the food supply and distribution systems are highly embedded (UNEP 2016).

Public and private sector partnerships (PPP) with coordination among food supply chain actors are recommended to reduce resource inefficiency and food losses and waste, which is currently responsible for 8 per cent of GHG. Especially in low and middle economy countries, food loss and waste happen due to deficiencies in infrastructure and logistics, obsolete or inefficient production technologies, poor managerial capacity, or people's lack of technical skills. Integrated measures include: coordination with transport authorities and actors to improve transport infrastructure (highways, waterways, and railways); technical and financial assistance to rural producers for the adoption of more resource-efficient practices and technologies (explained above); and improvements in the refrigeration systems of warehouses or cold storage, and making sure that they are more energy efficient.

An integrated approach to food systems also helps in the transition to a **circular economy,** making optimal use of natural resources, raw materials, and products, and reusing them. For instance, to prevent the waste of edible food, other measures can include: taxation on the disposal of edible food in landfills to encourage companies to promote reduction, redistribution, or reuse of food waste; or innovations in food packaging to better meet consumers' demands and reduce waste.

Especially at the city level, governments and stakeholders could invest in policies that **strengthen the connectivity between urban centres and their surrounding areas.** A "city-region" lens, as suggested by FAO (FAO / Food for the Cities Programme), is an effective mechanism in support of food systems planning and management. The aim is to "foster the development of resilient and sustainable food systems within urban centres, peri-urban and rural areas surrounding cities by strengthening rural-urban linkages" (FAO / Food for the Cities Programme).

Locally or regionally produced food is not by definition more environmentally friendly. But if governments make the right investments, they can stimulate more sustainable food production, reduce footprints from long-distance transportation, and still benefit food security. Relinking also offers many opportunities for new enterprises, such as packaging, transport, and trading (UNEP 2016), generating new job opportunities and contributing to countries' overall poverty-reduction objectives.

Many governments are opting for programmes on **urban and peri-urban agriculture,** production of food within and close to the urban centres, which increases cities' resilience and mitigates environmental impacts, including climate change. These programmes show great advantages in terms of providing local farmers with opportunities to become more integrated in evolving food systems, highly characterized by multi-national retail sectors. The inclusion of smallholder farmers in the food supply chain should be considered in any policy or action to promote sustainable food systems.

According to FAO (FAO / Urban Agriculture), urban agriculture provides employment and income for poor women and other disadvantaged groups. So it is also a matter of empowering vulnerable groups. As urban vegetable growers can sell directly through street food stands and market stalls, more income goes directly to them instead of middlemen. In addition, locally produced food requires less transportation, therefore reducing environmental impacts from transport. Local markets can more easily supply fresher and more nutritious products at competitive prices (FAO / Urban Agriculture). The multiplication of local actions like these is a great way to change human behaviour, as will be discussed in the next section.

Support to business eco-innovation — especially SMEs

Although highly dominated by large companies and retailers, the food sector is also composed of a number of small and medium-sized enterprises (SMEs), ranging from local food stalls, mom and pop shops, bakeries, and family-owned restaurants to medium-sized food processors. This ensemble of private actors makes the food sector the largest economic sector in many regions, such as the EU for instance (UNEP 2016).

In the context of highly competitive and globalized markets, companies will generally strive to be cost-efficient, which often leads to the externalization of environmental costs. For instance, the nature of ultra-processed foods makes them cheaper to produce and attractive to promote and sell, because they usually lead to high profit margins (UNEP 2016).

Governments play crucial roles in influencing the food business sector towards **eco-innovation,** in line with their national or local food policies and strategies. Eco-innovation is about setting enabling policies for the stimulation or support of companies to develop business models that address not only resource-efficiency issues, but also the outcomes to society (health and nutrition, smallholder farmers, vulnerable communities, etc.). For instance, food business companies could add nutritious components to their growing sustainability agendas. Especially in developing economies, support and assistance for SMEs to achieve eco-innovation (e.g., easing their access to finance and fostering new skills) is very important, as they are increasingly unable to compete with large food corporations.

Support to research and development (R&D)

Many state funding agencies have supported R&D through projects involving university-industry partnerships. These programmes should not be limited to looking for solutions in relation to, for instance, "raising the productivity of a narrow range of crop and livestock breeds". The world already produces enough food to feed 12 to 14 billion people, but is failing to feed its whole population. The question is how to minimize losses and waste, and increase accessibility, affordability, and the nutrition of food.

Establish sustainable public procurement of food programmes

Increasingly, governments in many countries and at all levels are using public procurement of food to drive innovation towards environmental and social improvements in their markets, and to support transformative development of food supply systems. As an example, Brazil's National Plan for Agroecology and Organic Production (2013–2015) facilitates the creation of local markets for agroecological products, mainly through the procurement of food from family farmers who meet certain requirements. Within the Brazilian school feeding programme, 30 per cent of the procurement needs to be from agroecological food produced by smallholder farmers. The outcomes of this policy include more sustainable food for the school children, the inclusion of smallholder farmers in the market, and reduction of transportation and transaction costs for both buyers and sellers (Meybeck and Redfern 2016).

Public procurement policies can be used very systematically and with increasing ambition in order to maximize sustainable food systems outcomes. Public procurement criteria can support governments to address several sustainable development objectives, such as environmental protection, social justice, food systems regulation (price regulation, strategic food reserves), food access, promotion of nutritious food habits (school feeding), and food aid (FAO 2016a, as cited in Meybeck and Redfern 2016).

b) Examples of how to influence the way citizens consume food

As countries around the world experience urbanization and economic growth (albeit to differing degrees), a nutrition transition has occurred, changing the face of food consumption (UNEP 2012). Current food consumption patterns significantly drive how our food production systems are designed and evolve, and how they operate. **By changing the way our societies currently relate to and consume food,** governments and stakeholders can significantly impact health and the environment. No matter the level of development in a country, any food and agriculture policy must include activities that support their citizens to eat better (more diversified, more nutritious, less resource intensive, and minimum waste) and to understand the impact of their food consumption behaviour (on the environment, on their health, and on the society as a whole). Local governments can especially play a strategic role in promoting this change. Cities are the centre of food demand today and thus can become incubators where ideas can be tested (e.g., urban farming, education campaigns, sustainable sourcing, food environment regulations, etc.).

Create environments for sustainable consumption of food

Our socioeconomic circumstances shape our behavioural patterns and consumption choices, and also define our footprints, from a sustainability perspective. This means that consumption patterns can be influenced by changing social norms—influencing how and where people buy, socialize, and perceive things. Food is considered one of the lifestyle domains that is most linked to environmental impacts today (Akenji and Chen 2016). On the other hand, consumers are a very diverse group of people, ranging from rural poor to urban poor to urban rich (UNEP 2016). They encounter different motivations, drivers, and determinants for consumption, which are also influenced by their traditions, religions, and cultures (Akenji and Chen 2016). Any sustainable food consumption strategy needs to take these factors into account.

The International Resource Panel (UNEP 2016) suggests that the **redesign or rethinking of the "food environment"** can be an important lever towards dietary change, and hence make a major contribution to increasing natural resource use efficiency. The food environment is the "physical, social, and economic surroundings that influence what people eat", playing a major role in determining food consumption patterns. The IRP points out that, especially in cities, food companies, restaurants, food vendors, and retailers are actively influencing this food environment (e.g., advertising to children, location, creating aromas, etc.), which in most cases are extremely based on ultra-processed foods, often rich in sugars, fat, and salt. The nature of those foods make them cheaper to produce, and thus very attractive for companies to promote and sell, and more likely to result in high profit margins.

Figure 7. Overview of emission reduction potentials in 2030 ($GtCo_2$ e per year) within the agriculture sector. Source: UNEP 2017

Category	Emission reduction potential in 2030 ($GtCO_2e$)	Category	Sectoral aggregate potential ($GtCO_2e$)
Cropland management	0.74	Basic	3 (2.3—3.7)
Rice management	0.18		
Livestock management	0.23		
Grazing land management	0.75		
Restoration of degraded agricultural land	0.5—1.7		
Peatland degradation and peat fires	1.6	Additional	3.7 (2.6—4.8)
Biochar	0.2		
Shifting dietary patterns	0.37—1.37		
Decreasing food loss and waste	0.97—2		

As already mentioned, externalities from food production — meaning the impacts of these activities on our health, environment, and society — should be factored into food prices. Total healthcare costs attributable to obesity and the overweight are set to double every decade, to reach USD 860.7-956.9 billion by 2030. During the next decade, deaths due to diseases related to overnutrition (e.g., diabetes and coronary heart disease) will overtake undernutrition as the leading non-communicable cause of death in developing countries (UNEP 2012).

Other possible interventions (UNEP 2016) include:

- Implementing stricter regulations on selling food items that are high in saturated fats and sugars or highly resource-intensive, or the introduction of certain price incentives;
- Restricting promotional activities such as advertising and other forms of marketing, especially if these are targeted to vulnerable groups like children;
- Regulating and planning the amount and location of food outlets like fast food restaurants, small shops, and supermarkets (local authorities could play a particularly important role in this); and
- Encouraging retailers and food outlet chains to establish codes of conduct around marketing.

Governmental policy interventions like the ones above require consultation with the private sector. Those policies also have a great influence on the way business innovation evolves, and can drive more companies to review and incorporate sustainability and nutrition aspects as part of their business models and strategies. However, consultations must not compromise or weaken the intended impact of the interventions.

Food consumption patterns are partly determined by food prices and household income. For instance, besides urban migration, the preference for more convenient, pre-packaged options, is also a result of wealth increase. Those types of food require more energy and materials, as they are transported over long distances (UNEP 2016). This can also increase the physical and cognitive distance between producers, consumers, and their environments.

Urban poor individuals are highly vulnerable to variable food prices, as 60-70 per cent of their household expenses relate to food. Less purchasing power influences their diets (lower food intake, less nutritious food) (UNEP 2012), and this group is more likely to experience both under- and over-nutrition. Although supermarkets are spreading rapidly in low-income countries, many urban poor consumers still rely on traditional food distribution networks to purchase their food (FAO 2013).

The **promotion of local markets** is another opportunity to influence food environments, address urban food security issues, and benefit overall sustainable food systems. These markets can be established in multiple neighbourhoods of cities, and also be supplied by urban and peri-urban agriculture structures (discussed in Section a). Consumers can have access to fresher food and better prices. High income countries and middle classes of developing economies are progressively more worried about health aspects, and are starting to give preference to buying in local markets. The IRP points out that "the current societal trends and debates on healthy food could be used as a vehicle to encourage discussions on sustainable food as well, particularly where healthy and sustainable foods coincide" (UNEP 2016), which is in the majority of cases.

Promote sustainable diets

Governments play an important role in promoting behaviour change and sustainable consumption of food, in which nutrition and sustainable diets play a key role in meeting sustainable food systems. Studies suggest that a shift towards less resource-intensive diets contributes to a significant reduction in resource use and environmental impacts of food production, while at the same time can be consistent with good health (UNEP 2016).

The integration of "sustainable diets" into agriculture and food policy could result in a more coherent and sustainable set of policy tools to support nutritional health, food security, and an agro-ecological system (UNEP 2012). Global research published by FAO and the Food Climate Research Network (Fischer and Garnett 2016) suggest that **dietary guidelines** should be seen as a key component of a coherent food policy. However, the study points out that only 83 out of 215 countries worldwide currently have dietary guidelines. This absence is particularly apparent in low income countries (e.g., only five African countries have guidelines). Moreover, only four countries have clearly combined sustainability and health aspects into their guidelines (Brazil, Germany, Qatar, and Sweden). Dietary guidelines are still developed in silos, being predominantly led by the Ministry of Health alone, while the knowledge and expertise of other sectors needs to be utilized (e.g., environmental life cycle assessment, the agricultural and environmental sciences, economics, sociology, and animal welfare). On the other hand, research also shows that even where sustainability elements are not included in guidelines, recommendations based on health (e.g., to increase consumption of fruits,

vegetables, and whole grains; to limit red and processed meat consumption; and to maintain energy balance) are also likely to reduce environmental impacts.

One important feature of a sustainable diet is diversity. An increase in **dietary diversity** can have positive effects on health compared with a diet dominated by cereals, roots, and tubers (UNEP 2016). The **diversification of food production,** as opposed to monoculture, also benefits the resilience of our food systems and supports smallholder farmers, in addition to offering the potential to increase yield, as shown in the previous section.

Prevent or reduce food loss and waste

If food waste was a country, it would be the world's third-largest emitter of GHGs (FAO 2015). Food waste is a key indicator of the health of our food systems. More sustainable consumption of food includes the idea of reducing food waste, and this shift can have a significant effect in terms of reducing pressure on our natural resources, positively influencing production patterns and increasing the overall well-being and health of our society.

Public awareness campaigns can play a significant role in addressing and curbing unsustainable food consumption and preventing food waste. In low income countries, food waste is more connected to food systems' weak infrastructure. In comparison, the waste generated by the middle classes of emerging economies and high income countries are highly related to consumer behaviour and preferences (e.g., rejection of food items that show an "ugly" form or appearance).

Besides learning about the negative impact of food waste, consumers could learn how to better plan their food shopping, understand expiration dates, improve food storage at home, and make use of food that is about to expire through different recipes (Think. Eat. Save). Reducing food waste has the potential to save resources, reduce pollution, and increase food security, for example by feeding the 12.5 per cent of the world's people who are malnourished (FAO, WFP et al. 2012).

Governments should also seek **partnerships with the retail sector and food companies** in the fight against food waste. This can be done through voluntary agreements. Some studies suggest that retailers can more effectively foster customer loyalty by encouraging better consumer purchasing habits to reduce household waste than by the use of lower prices and special offers (UNEP 2012). In the European Union, where waste of edible food can be up to 50 per cent, policy reviews include discussions on changing the size of packaging to help consumers buy just the right amount for their consumption needs.

Invest in education and awareness raising

Today, citizens have limited information and insight into what they consume and the consequences of their consumption behaviour. Raising people's awareness is therefore a crucial lever for change, particularly if people are able to relate to the new information and messages they receive.

More coordination with the education sector is required as part of effective food policy strategies. Improved education on healthy eating in schools from an early age is essential to changing eating habits (IPES 2016). Children need to be taught how to prepare food from basic ingredients, and need to be aware of its nutritional composition (UNEP 2016).

School curricula at all levels should include modules on the multiple dimensions of food systems, including hands-on experiential programmes such as **school gardens,** food preparation facilities, and making meals a time for learning as much as for eating (Fischer and Garnett 2016).

Promote consumer information

Consumers are a crucial node in food systems. By exercising effective demand, they basically determine food production, although this demand is strongly influenced by food availability and income as well as by the food environment (UNEP 2016). Environmental impacts from food production can result from a number of different factors, such as the type of production system, the season, and transport distances. Governments can introduce measures to ensure food labels are reliable and provide accurate and necessary information to consumers. Labels can support consumers to opt for less environmentally impactful food products. Labeling could also be used as a way to increase people's awareness of the farmers' share in the price and profits, and the share in price that consumers pay for advertising and marketing costs (UNEP 2016).

The challenges involved with building truly sustainable food systems are multidimensional and interrelated, and thus require a holistic approach: examining food systems as a whole rather than in separate pieces, valuing outcomes over processes, and embracing a variety of voices instead of individual perspectives.

The Collaborative Framework for Food Systems Transformation explains how governments and stakeholders, at national or local levels, can apply a food systems approach to policymaking and implementation. The publication suggests practical and easy-to-follow actions for performing analyses of food systems, expanding or reorienting existing activities, integrating policy interventions, and building effective food systems governance.

Taking a systems approach when developing and implementing food and agriculture interventions is potentially transformative for any country or city. It will enable food systems actors to work within the complexity of food systems, and support more efficient use of natural resources, while simultaneously improving societal outcomes (such as human health and rural livelihoods).

This publication is an output of the One Planet Network Sustainable Food Systems Programme and contributes to the Programme's objective to support countries to shift towards sustainable food systems, and to comply with international commitments, such as the 2030 Agenda for Sustainable Development.

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