Towards a Common Understanding of Sustainable Food Systems

Key approaches, concepts and terms

Draft V1.0
Table of contents

i. Acknowledgements........................................................................................................................................3

1. Introduction: rationale and background ........................................................................................................4
  1.1. Rationale and authorship ..........................................................................................................................4
  1.2. Background on the One Planet Sustainable Food Systems Programme ..............................................5
  1.3. Intended use, structure and scope ..............................................................................................................6

2. The Sustainable Food Systems Approach and related key concepts .........................................................8
  2.1. Sustainable Food Systems: concept and approach .................................................................................8
      2.1.1. The concept of Sustainable Food Systems ......................................................................................8
      2.1.2. The Sustainable Food Systems Approach ..................................................................................12
  2.2. Definitions and discussion of key concepts in relation to sustainable food systems ..........................16
      2.2.1. Sustainable Diets .............................................................................................................................17
      2.2.2. Sustainable Value Chains ...............................................................................................................19
           2.2.2.1. The Sustainable Food Value Chains Approach ...................................................................21
      2.2.3. Food Losses and Waste ..................................................................................................................23
      2.2.4. Resilient Production Systems ........................................................................................................26

3. Different Roads leading to Sustainability .....................................................................................................29
  3.1. Selected key approaches and their relation to sustainable food systems ..............................................29
      3.1.1. Sustainable Intensification .............................................................................................................29
      3.1.2. Ecosystem Approach and Agroecology .........................................................................................31
      3.1.3. Territorial Approaches ..................................................................................................................33
      3.1.4. Public health approaches ................................................................................................................36
  3.2. An illustration of interlinkages, overlaps and complementarities ...............................................................38
  3.3. Main strategies to promote sustainable food systems .............................................................................40

4. Further definitions of relevance to Sustainable Food Systems ....................................................................44

Annex 1: A comprehensive illustration of the global food system .................................................................59
Annex 2: The SDG “Wedding Cake” ..................................................................................................................60
Annex 3: A conceptual framework of food systems for diets and nutrition ..................................................61

5. Sources .........................................................................................................................................................62
i. Acknowledgements

Technical support and drafting
Particular thanks go to the task team that has supported the development of this publication since its conception phase, by providing feedback and input on its outline and earlier drafts, including co-authorship:
Allison Loconto, Institut national de la recherche agronomique (INRA)
Nicola Jenkin, Pinpoint Sustainability
Charlotte Pavageau, Biovision Foundation
Elise Golan, United States Department of Agriculture (USDA)
David Gould, IFOAM – Organics International
Sandro Dernini, Centre international de hautes études agronomiques méditerranéennes (CIHEAM)
Christine Campeau, United Nations Standing Committee on Nutrition (UNSCN)
Divine Njie, Food and Agriculture Organization of the United Nations (FAO)
James Lomax, United Nations Environment Programme (UN Environment)
Marina Bortoletti, UN Environment
Chavanne Hanson (Nestlé)

Contributions
In addition, we would like to thank all members of the Multi-stakeholder Advisory Committee as well as the co-leadership and further partners of the One Planet Sustainable Food Systems Programme for their valuable inputs, in particular: Daniel Bachmann (Global Nature Fund), Natalia Basso (Secretaría de Gobierno de Agroindustria, Argentina), Jean-Marc Faurès (FAO), Marion Hammerl (Global Nature Fund), Natascha Kooiman (Smaackmakers), Pradeep Mohapatra (Udyama), Jamie Morrison (FAO), Michaël Sapin (FOAG), Urs Schenker (Nestlé), Carola Strassner (Muenster University of Applied Sciences).

Overall coordination, drafting and editing
Patrick Mink, Federal Office for Agriculture, Switzerland (FOAG)
1. Introduction: rationale and background

1.1. Rationale and authorship

Current food systems are unsustainable. Although crop yields have increased significantly in many parts of the world in the last few decades, chronic hunger is again on the rise – up from 815 million in 2016 to 821 million in 20171, and soils as well as biodiversity and habitats are increasingly degraded.

Local and native crops, many of which are climate resilient and adapted to the local conditions and cultural context, are rapidly disappearing. Greenhouse gas (GHG) emissions from the food value chain, including agriculture-related deforestation, farming, processing, packaging, transportation and waste, account for about half of all human GHG emissions.2

Approximately one third of all food produced is lost or wasted rather than consumed, with a significant environmental footprint in terms of the water and land used. In turn, climate change is increasing the risk of weather-related natural disasters jeopardizing livelihoods, food security, clean water and sanitary conditions, which are essential for good nutrition.

People in many parts of the world are shifting to diets rich in ultra-processed foods that are too high in salt, sugars and trans fats, animal proteins and have lower nutrient value. Unhealthy diets have become a main risk for human health, leading to a rise in non-communicable diseases (NDCs) like diabetes and obesity.3 NCDs are now the main cause of mortality worldwide and are responsible for 70% of global deaths4; equivalent to 40 million people5.

These challenges are multidimensional and interrelated, and therefore require the adoption of a holistic approach that addresses all elements across the entire food system, rather than focusing only on one or a subset of food system components. This is echoed by the Ministerial Declaration of the 2018 High-level Political Forum on Sustainable Development (HLPF), which calls “upon all stakeholders to adopt a sustainable food systems approach […]”, and states that “resilient, sustainable and inclusive food systems that protect, enhance and restore natural resources, sustain rural and urban livelihoods and provide access to nutritious foods from smallholder producers must be at the heart of

---

1 SOFI 2018. Furthermore, the number of stunted children has decreased from 165.2 million in 2012 to 150.8 million in 2017, a 9 percent decline, but remains unacceptably high. In 2017, 7.5 percent of children under five – 50.5 million – were affected by wasting (low weight for height) consequently putting them at a higher risk of mortality.


3 Obesity has become a global pandemic with rates at least doubling in more than 70 countries since 1980. Many countries now face a “double burden,” where undernutrition coexists with overnutrition because our food systems and lifestyles are enabling these trends (SOFI 2018).


efforts to promote sustainable consumption and production.”

Since governments remain in the driving seat, promoting efforts towards coherent implementation of globally agreed frameworks and commitments such as the 2030 Agenda for Sustainable Development, the UN Framework Convention on Climate Change, the Convention on Biological Diversity and the Second International Conference on Nutrition, can be a useful step in this direction.

Over the past years, there has been an increase of discussions and work around sustainable food systems and related concepts. While this is a welcome indication of the growing global awareness for the need to transition towards more sustainable food systems, there is a potentially confusing and counterproductive diversity of views and language being used among countries and other stakeholders on what sustainable food systems are and how they can be achieved.

A common understanding, both in relation to the challenges to be addressed, the objectives to be attained, as well as the approaches that can be used to meet these objectives, is crucial in a complex system composed of a variety of interdependent actors. Through this publication, we, the One Planet Sustainable Food Systems (SFS) Programme, aim to strengthen and promote a global common language and understanding.

1.2. Background on the One Planet Sustainable Food Systems Programme

The SFS Programme is a global multi-stakeholder partnership with a network of currently more than 150 key food system actors worldwide. The SFS Programme has the goal to accelerate the shift towards sustainable food systems, through both normative as well as action-oriented work implemented by collaborative initiatives at global, regional and national level. It aims to promote a holistic, system-based approach towards more integrated and inclusive policy-making. The initiatives of the SFS Programme promote awareness raising activities, strengthen capacities and enabling environments, and increase access to information, knowledge and tools, focusing on the areas of sustainable diets, sustainable value chains, resilient food production systems, and food losses and waste reduction.

The SFS Programme was launched in 2015, and has since then been co-led by Switzerland, South Africa, Hivos and WWF. The four Co-Leads jointly steer and coordinate the implementation of the SFS Programme, with strategic discussions and decisions taken by a Multi-stakeholder Advisory Committee (MAC).

---

6 ECOSOC, 2018, Ministerial declaration of the 2018 high-level political forum on sustainable development, convened under the auspices of the Economic and Social Council, on the theme “Transformation towards sustainable and resilient societies”, para. 26.

7 Adapted from CABI 2018

8 Adapted from HLPE 2018
The SFS Programme is part of the broader One Planet Network – which has formed to implement the United Nations 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP). The 10YFP was adopted by Heads of State and Government at the UN Conference on Sustainable development in Rio de Janeiro (Rio+20 Conference) in 2012, based on the so-called Marrakech Process which – in response to the Johannesburg Plan of Implementation of the 2002 World Summit on Sustainable Development (WSSD) - set up the task forces for the development of the initial five multi-stakeholder programmes of the 10YFP. However, despite the numerous environmental and socio-economic challenges outlined above, the Marrakech Process lacked a task force dealing with food. This is why in the run up to the Rio+20 Conference, the UN Food and Agriculture Organization (FAO) and the UN Environment Programme (UN Environment) jointly created a task force for the development of a global multi-stakeholder programme on food systems.

The implementation of the 10YFP is enshrined in target 12.1 of the 2030 Agenda for Sustainable Development, and the SFS Programme reports through the 10YFP Secretariat to the UN Economic and Social Council and HLPF. In particular, the 2018 HLPF Ministerial Declaration highlighted the One Planet Network as “an important implementation mechanism for Sustainable Development Goal 12”.

1.3. Intended use, structure and scope

This publication has a focus on the key terms and concepts that are at the heart of the One Planet Sustainable Food Systems Programme. However, the ambition is for it to become a reference document for anyone working towards more sustainable consumption and production patterns in the area of food and agriculture. In this sense, the publication aims to serve the dual purpose of explaining SFS Programme-specific terms to Programme members, and at the same time strengthening the common understanding of key approaches, concepts and terms related to sustainable food systems beyond the membership of the SFS Programme.

---

9 Rio+20 outcome document
10 ABC of SCP
11 Reference to work FAO/UNEP Programme / AFTF. At the formal request of Switzerland, South Africa, Costa Rica and the United States, this “Sustainable Food Systems Programme” was subsequently included in the 10YFP.
12 For more information on the governance structure of the 10YFP, see: http://web.unep.org/10yfp/about/governance
13 HLPF 2018 para 26. However, the development of sustainable food systems is not only central to achieving SDG12 on responsible production and consumption (SDG12), but they also contribute significantly to poverty reduction (SDG1), ending hunger, achieving food security and improved nutrition (SDG2), improving health and wellbeing (SDG3), and promoting decent work and employment (SDG8), amongst others.
The publication can thus be understood as a collection of concepts that may be useful to experts working on sustainable food systems. It is important to note, however, that the inclusion of any specific term in this publication does not imply endorsement by the individual members of the SFS Programme, nor should there be any implication that a sustainable food system must include all the terms and concepts described herein. Rather, our hope is that the publication will serve as a platform to facilitate knowledge and promote common understanding of relevant concepts and approaches.

The publication is structured into three main chapters: one that explores the sustainable food systems concept and approach as well as a series of related concepts; one that looks at further approaches that can support more sustainable food systems; and a glossary with definitions of terms that are of relevance to sustainable food systems.
2. The Sustainable Food Systems Approach and related key concepts

This chapter focuses on defining the concept of sustainable food systems and examining their complexity and scope, and the Sustainable Food Systems Approach will be introduced. The chapter then defines and introduces four further key concepts that are closely related to the concept of sustainable food systems.

2.1. Sustainable Food Systems: concept and approach

2.1.1. The concept of Sustainable Food Systems

**Definition:**

A *food system* gathers 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 socio-economic and environmental outcomes.

A *sustainable food system* (SFS) is a food system that ensures food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition of future generations are not compromised.\(^{14}\)

The concept of sustainable food systems is at the heart of this publication as well as of the One Planet SFS Programme. It is also at the heart of a growing number of discussions by diverse actors around the world, including actors from different government agencies and international and civil society organizations with different backgrounds and mission areas. As it proliferates, the term has come to mean different things to different people. Some interpret SFS with a focus on sustainable food *production* systems, in line with SDG 2.4 of the 2030 Agenda\(^ {15}\), while others focus primarily on healthy food and nutrition. Yet others view SFS through the lens of biodiversity loss and greenhouse gas emissions.

In order to foster consensus on the meaning of sustainable food systems and promote holistic, systems-based thinking around sustainable consumption and production (SCP) in the area of food and agriculture, the FAO and UN Environment established in 2011 the multi-stakeholder Agri-food Task Force on SCP.\(^ {16}\)

\(^{14}\) HLPE, *Food losses and waste in the context of sustainable food systems*, 2014

\(^{15}\) SDG 2.4: “By 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality.” Annex 1 contains a comprehensive diagram that aims to illustrate the relation between sustainable food systems and sustainable production systems.

In 2014, the Agri-food Task Force endorsed the above definitions of food system and sustainable food system proposed by the High Level Panel of Experts on Food Security and Nutrition (HLPE), and to make it the foundation of the One Planet (10YFP) SFS Programme.\textsuperscript{17}

Although the definitions have not been internationally negotiated and agreed, the Committee on World Food Security (CFS) welcomed the HLPE report that introduced them and formulated a set of recommendations for the reduction of food losses and waste based on the same report. As the CFS is “the foremost inclusive international and intergovernmental platform for all stakeholders to work together to ensure food security and nutrition for all”\textsuperscript{18} and the HLPE is the science-policy interface providing evidence-based analysis and advice to the CFS\textsuperscript{19}, their endorsement of the above definitions of food system signifies broad acceptance.

It is important to point out that the food system elements mentioned in the definition are not exhaustive, and others (e.g. technology or regulations) could be mentioned. Similarly, alternative designations are sometimes used for the food system activities - e.g. growing and harvesting instead of “production”, etc., and many would argue that final disposal, for example, can also be understood as a food system activity. See in this regard also figure 1 below. The SFS Programme adopts a broad understanding of the definitions proposed by the HLPE, acknowledging that the absence of an explicit reference to certain aspects therein does not necessarily imply that these are not part of a sustainable food system. Similarly, the SFS Programme acknowledges that to avoid compromising the economic, social and environmental bases to generate food security and nutrition of future generations, a sustainable food system does also have to guarantee these bases for present generations.

This means that sustainable food systems are profitable throughout (economic sustainability); have broad-based benefits for society (social sustainability); and have a positive or neutral impact on the natural environment (environmental sustainability).

Sustainable food systems lie at the heart of the SDGs, which call for major transformations in agriculture and food systems in order to end hunger, achieve food security and improve nutrition by 2030.\textsuperscript{20,21}

A key element of the above definition of a food system is that it describes a system that is more than a linear linking of the individual stages of the value chain from production to processing, distribution and preparation to consumption. Instead, food systems incorporate

\textsuperscript{18} http://www.fao.org/cfs/workingspace/ws-home/en/
\textsuperscript{19} http://www.fao.org/cfs/cfs-hlpe/en/
\textsuperscript{20} FAO, Sustainable Food Systems, Concept and framework (2018)
\textsuperscript{21} An alternative way to illustrate the three dimensions of sustainable development, implying that economies and societies are seen as embedded parts of the biosphere, has been proposed by the Stockholm Resilience Centre. The illustration is contained in annex 2.
a web of all of the elements and activities that relate to these stages, as well as their socio-economic and environmental impacts. This can be visualized as a feedback-loop mechanism, with a series of food system elements that impact on the outcomes of food system activities, while the food system activities and their outcomes, in turn, have an effect on the elements that act as drivers in the food system. For example, natural resources such as soils, biodiversity and water form the basis of all food consumption and production, however food consumption and production patterns impact on the natural resource base, for example through pollution and waste. Feedbacks can be positive or negative as they impact socio-economic outcomes (such as small-holder farmers’ socio-economic situation, poverty, employment generation and income), environmental health (such as forest conservation/degradation; more/less pollution, etc.) and food security and nutrition (such as healthy food and diets; access to food; food prices, etc.). These interactions and feedback loops are illustrated in figure 1.  

*Figure 1: An illustration of food systems elements, drivers, activities and outcomes*

---

22 Adapted from Mulet, M., Mink, P., Dernini, S., Bortoletti, M., Lomax, J., 2018

23 Adapted from CIAT, found in SFS transformative framework.
While figure 1 attempts to illustrate food systems in a simplified way, it shows that the food and agriculture sector exists within a complex web of activities, outcomes and drivers. For example, in addition to the natural resource base and the activities related to producing and consuming food, food systems are shaped by social norms and the culture in which those activities are embedded, and which influence dietary preferences. Moreover, food systems include a multitude of people – including all of us who depend on food to live, as well as a large number of specific actors who influence the food sector both indirectly and directly, such as producers, processors, retailers and consumers governments, NGOs, agriculture and health officers, teachers, etc., each representing a different set of interests. In addition, different types of institutions, regulations, subsidies, and laws further influence everyday performance and outcomes of food systems.

Food systems are composed of sub-systems (e.g. farming system, waste management system, input supply system, etc.) and interacts with other key systems (e.g. energy system, trade system, health system, etc.). Therefore, a structural change in another system, for example a policy promoting more biofuel in the energy system, may also have a significant impact on the food system.

In addition, trade and transportation infrastructure – both at national level as well as internationally – play an increasing role in food systems, as the ‘food production system’ - including related food processing - often does not geographically coincide with the ‘food consumption system’. Climate is another example of a factor interlinked with food systems, which is not contained within borders.

Finally, food systems can cover different geographic and organizational scales and can be driven by a variety of public, private and civic actors. The HLPE report on Nutrition and Sustainable Food Systems proposes a classification of three different broad types of food system: traditional food systems, modern food systems and mixed food systems. While some of these different types of food systems run in parallel without much crossover, others are deeply embedded one within the other. One example of a food system that runs across different scales is provided in box 1.

---

24 While specific definitions are likely to vary from country to country, the food and agriculture sector typically comprises: i) entities that are engaged in growing crops, raising livestock and harvesting other animals as well as timber; ii) entities that transform agricultural products into food and beverage products for intermediate or final consumption (including packaging, etc.); iii) wholesalers and retailers (including transportation, etc.).
25 The High Level Panel of experts on Food Security and Nutrition (HLPE) has proposed a further illustration of food systems in its 2017 report “Nutrition and food systems”. This illustration is included in annex 3.
26 Adapted from SFS transformative framework
27 Adapted from FAO, Sustainable Food Systems, Concept and framework (2018)
28 For more information see: HLPE 2017, pp. 35-40.
Box 1: Red Ecovida, Brazil

For example, the Red Ecovida in Brazil is organized in local food systems that consist of about 30 farmer families that produce, exchange and consume what they grow. At the same time, these farmers groups are connected in a network of over 5,000 families across 3 states in Southern Brazil where they are exchanging their goods across agro-ecological zones, with some farmers specialized in processed products and the farmers themselves taking responsibility for the transport. Some farmers are also selling a portion of their produce to the public procurement program, which organizes the farmers into a national system of competitive sourcing. Finally, since the farmers are certified according to the Brazilian organic standard, they are integrated into national and regional supermarket supply chains and some coffee producers are also exporting their products to Europe.

The scope and complexity of food systems can lead to significant challenges in the pursuit of sustainability, as well as to possible trade-offs. For instance, eating a certain type of food may be nutritious from a purely human health point of view, but the way it is produced, processed and/or distributed may have more or less negative impacts on the environment; likewise, food can only be considered as being produced sustainably if it provides a decent income to those who produce it.

2.1.2. The Sustainable Food Systems Approach

Definition:

A Sustainable Food Systems Approach considers food systems in their totality, 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 maximize societal outcomes across environmental, social (incl. health) and economic dimensions.²⁹

The first objective of the SFS Programme is to “raise awareness of the need to shift to more sustainable food systems and to apply a holistic, systems approach to addressing food security and nutrition.” With regard to this approach, the SFS Programme funding document states: “[..] Linkages need to be actively made between food production and consumption, nutritional health and the underlying social-economic, biophysical, cultural and institutional elements that ultimately affect the quantity, quality and affordability of food, as well as health and wellbeing. Such a sustainable food systems approach embraces the interconnectedness of all the food-related activities and the environment within which these activities occur [..]”.³⁰ This requires to look at specific issues through a sustainable food

²⁹ Adapted from FAO, Sustainable Food Systems, Concept and framework (2018), and SFS transformative framework
systems lens, looking for the underlying causes, as well as possible hidden interlinkages and unforeseen consequences, and interlinkages with other systems outside the food systems (e.g. health or trade system).

The Sustainable Food Systems Approach considers all relevant causal variables of a problem and all social, environmental, and economic impacts of the solutions to achieve transformational systemic changes. Encouraging development practitioners and policymakers to see the bigger picture will also help facilitate multi-stakeholder collaboration and policy coordination at different levels to promote a more balanced relationship and jointly address future challenges. While there will clearly be trade-offs to be made (i.e. between key priorities of the food systems: inclusive poverty reduction, increased agricultural productivity, improved nutrition, and enhanced environmental sustainability), there will also be opportunities to simultaneously accomplish multiple objectives. A Sustainable Food Systems Approach can help identify such synergies, as well as facilitate the coordination needed to achieve them.\textsuperscript{31}

Under a Sustainable Food Systems Approach, sustainability is examined holistically. This is illustrated in figure 2. On the economic dimension, a food system is considered sustainable if the activities conducted by each food system actor or support service provider are commercially or fiscally viable. The activities should generate benefits, or economic value-added, for all categories of stakeholders: wages for workers, taxes for governments, profits for enterprises, and food supply improvements for consumers. On the social dimension, a food system is considered sustainable when there is equity in the distribution of the economic value added, taking into account vulnerable groups categorized by gender, age, race and so on. Of fundamental importance, food system activities need to contribute to the advancement of important socio-cultural outcomes, such as nutrition and health, traditions, labour conditions, and animal welfare. On the environmental dimension, sustainability is determined by ensuring that the impacts of food system activities on the surrounding natural environment are neutral or positive, taking into consideration biodiversity, water, soil, animal and plant health, the carbon footprint, the water footprint, food loss and waste, and toxicity.\textsuperscript{32}

\textsuperscript{31} Adapted from FAO, Sustainable Food Systems, Concept and framework (2018)
\textsuperscript{32} Adapted from FAO, Sustainable Food Systems, Concept and framework (2018)
By way of illustration, any proposed measures to address a problem (e.g. animal diseases) or to take advantage of a new opportunity (e.g. a new green technology or profitable market), will have to be assessed against all other dimensions of sustainability to ensure there are no undesirable impacts. This holistic vision allows to use potential synergies and to reveal often hidden trade-offs, to ensure that while the targeted impact is positive, the net overall impact on the value added of the food system activities will also be positive.\(^{34}\)

In order to minimize trade-offs and promote viable solutions to food system challenges, the Sustainable Food Systems Approach’ must also be a multi-stakeholder approach. Overcoming polarization and traditional power dynamics as well as promoting inclusiveness are paramount conditions to enhance multi-stakeholder collaboration.\(^{35}\) Multi-stakeholder councils or roundtables for food system actors can help them achieve these conditions\(^ {36}\), as these spaces can act as environments of experimentation to develop new rules for engagement to tackle a specific complex problem.\(^ {37}\) The SFS Programme is an example of such a co-owned space at the global level (see box 2).

---

\(^{33}\) FAO, Sustainable Food Systems, Concept and framework (2018)

\(^{34}\) Adapted from FAO, Sustainable Food Systems, Concept and framework (2018)

\(^{35}\) CNS-FAO 2016


\(^{37}\) Waddel et al, 2013


Box 2: The SFS Programme’s Multi-stakeholder Approach

Addressing the interlinked challenges related to food requires a holistic and systemic approach to accelerate the shift towards more sustainable food systems. The Sustainable Food Systems (SFS) Programme of the One Planet Network contributes to this transformation by building synergies and cooperation among stakeholders, and one of its focus themes aims at the promotion of multi-stakeholder platforms at all levels.

Since its launch in 2015, the SFS Programme has been co-led in a multi-stakeholder way by two civil society organizations, Hivos and WWF, and two governments, Switzerland and South Africa. It currently gathers over 150 members worldwide, grouped into five stakeholder clusters: government agencies; UN agencies and other intergovernmental organizations; civil society organizations; scientific and technical organizations; and the private sector. The four co-lead organizations are steering the SFS Programme, supported by a Multi-stakeholder Advisory Committee (MAC) with 23 members from the five stakeholder clusters, taking their decisions by consensus.

By building on the respective strengths as well as existing expertise and activities of the different actors involved, and by promoting new partnerships and synergies, the SFS Programme has in particular managed to pool resources and make their use more efficient, while achieving stronger collective impact. Concretely, several of its members have joined forces in so-called “core initiatives”, which are in themselves multi-stakeholder partnerships acting at different levels (global, regional, national/local) - some of them rather policy and knowledge oriented while some are more action oriented, or both.

The SFS Programme has a global scope, but its portfolio consists of eight core initiatives, more than 50 affiliated projects and four trust fund projects described on the website and implemented at regional, national or even subnational level.

In policy terms, a food systems approach will connect elements within various policy agendas – primarily environmental, agricultural, health, trade and industry - expanding opportunities for any country to achieve sustainability in their food systems. A Sustainable Food Systems Approach can thereby help identifying and minimizing 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

38 Box adapted from HLPE 2018a and CABI 2018
39 See: http://www.scpclearinghouse.org/sustainable-food-system/actors
40 For more information on the governance of the SFS Programme and the respective roles of its different actors, please refer to the SFS Programme Terms of Reference (ToR), available here: http://www.scpclearinghouse.org/sites/default/files/10yfp_sfsp_terms_of_reference_tor_-_editable_v31oct2017.docx
41 For an overview of the SFS Programme’s core initiatives, please see: http://www.scpclearinghouse.org/sustainable-food-system/core-initiatives-sfs-programme
42 Adapted from SFS Framework
sustainability dimensions. Another example of a possible outcome of a Sustainable Food Systems Approach when applied to policy making, are holistic food policies that aim to ensure the provision of sufficient nutritious, sustainable, culturally acceptable, desirable and affordable food to consumers, while generating decent incomes to producers and other value chain actors, as well as protecting natural resources both domestically and abroad.

The Transformative Sustainable Food Systems Framework (hereafter “SFS Framework”, developed under the leadership of UN Environment in the framework of the SFS Programme, provides more detailed guidance to governments and other relevant food system actors on how to implement a food systems approach to decision making. It proposes key policy-levers, methodologies, tools and collaborative activities across the food systems for exploring how the transition to sustainable food systems could be accelerated by decision makers. The main actions suggested by the SFS Transformative Framework in this regard are to:

(i) establish a group of food systems champions and build political momentum;
(ii) conduct a holistic food systems assessment;
(iii) initiate a multi-stakeholder process for dialogue and action; and
(iv) improve food systems governance in the long term.43

2.2. Definitions and discussion of key concepts in relation to sustainable food systems

The concepts described in the four following sub-sections are in line with the focus themes of the One Planet SFS Programme, which are44:
- Sustainable diets;
- Sustainability along all food value chains;
- Reduction of food losses and waste; and
- Resilient, inclusive and diverse food production systems.

The One Planet SFS Programme views these as the four key intervention areas in the pursuit of sustainable food systems. While their respective importance can vary depending on the socio-economic context of any given country, they are a part of any food system and together they address all food system activities and outcomes.

---

43 SFS Framework.
44 These four focus themes are in addition to “Local, national and regional multi-stakeholder platforms”, which is referred to in Box XX.
2.2.1. Sustainable Diets

**Definition:**

*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.\(^\text{45}\)

The concept of sustainable diets takes into account four dimensions: health and nutrition, environment including biodiversity, economy, and socio-cultural factors. By taking into consideration the multi-dimensional nature of diets and food systems, an assessment of the sustainability of diets requires multi-criteria and trans-disciplinary approaches. This is needed in order to advance the existing knowledge-sharing tools and mechanisms for improving the sustainability of current diets while improving sustainable food systems ability to deliver food security and nutrition for all.

There is an increasing interest for the concept of sustainable diets in both developed and developing countries, which is substantiated by the fact that several international and regional conferences have been organized as platforms for peer to peer learning towards a greater understanding of what the term implies in different locations.\(^\text{46}\) Choosing seafood from non-threatened stocks surfaced as one recommended way to be more sustainable, as did choosing locally sourced, seasonal products. Reducing the consumption of ultra-processed foods would also have a positive effect on the environment and human health.

Sustainable and healthy diets have co-benefits on human health and wellbeing, as well as on planetary health. A transition to more nutritious and diverse diets is frequently projected to result in reduced GHG emissions, as well as likely reductions in non-communicable diseases.\(^\text{47}\) Thus, sustainable diets provide a way forward for achieving relevant goals, targets and commitments, both global and local, including the Sustainable Development

---

\(^{45}\) FAO, *Sustainable diets and biodiversity: directions and solutions for policy, research and action*, 2012

\(^{46}\) For example the International Symposium on Biodiversity and Sustainable Diets: United against Hunger, the Second International Conference on Nutrition, the International Symposium on Sustainable Food Systems for Healthy Diets and Improved Nutrition and eventual Regional Symposia on Sustainable Food Systems for Healthy Diets and Improved Nutrition, and the Sustainable Diets in the Context of Sustainable Food Systems.

\(^{47}\) UNSCN, *Sustainable Diets for Healthy People and a Healthy Planet*, 2017, Rome. Globally, it is estimated that transitioning to more plant-based diets, in line with WHO recommendations on healthy eating (WHO 2015) and guidelines on human energy requirements (WHO 2004) and recommendations by the World Cancer Research Fund (WCRF/AICR, 2007), could reduce global mortality by 6-10% and food-related greenhouse gas emissions by 29-70% compared with a reference scenario for 2050 (Springmann et al. 2016b).
Goals of the 2030 Agenda for Sustainable Development\(^{48}\), as well as the commitments of the United Nations Decade of Action on Nutrition (2016-2025).\(^{49}\)

The Mediterranean diet is one example of a sustainable diet\(^{50}\), in practice. It is characterized by four benefits and country specific variations: i) well-documented health and nutrition benefits, ii) low environmental impacts and richness in biodiversity, iii) high socio-cultural food values, and iv) positive local economic returns.\(^{51}\) This could be considered as a model to be used elsewhere. To encourage uptake, a joint publication of FAO and the Food Climate Research Network ‘Plates, pyramids, planet’ provides decision makers with an in depth review of the state of play of how countries incorporate sustainability into their Food Based Dietary Guidelines (FBDGs). Currently only few countries, including Sweden, Brazil, Germany and Qatar, have included sustainability criterion in their FBDGs but more could be considered to reap its benefit. Market regulations and economic incentives could be effective in steering dietary patterns.

Improving food systems for sustainable diets requires a cross-sectoral effort to reverse the processes of simplification and homogenization of diets, the degradation of ecosystems, and the erosion of biodiversity. Both programmatic activities as well as holistic policies towards sustainable food production and food consumption are needed for the promotion of sustainable diets.

There is a need for further studies that explore the linkages and synergies of sustainable diets and agricultural biodiversity, nutrition, food consumption, food production, agriculture and sustainability to improve nutrition and food security, through the characterization of different agro-ecological zones for different related models of sustainable diets. In addition, people need better information and clearer recommendations regarding environmentally, socially and economically sustainable food and how food consumption impacts on all elements of the food system. Although the evidence base must be improved, existing knowledge warrants immediate action to promote more sustainable diets in nutrition and food systems programmes, by linking food security, nutrition and sustainability.

Taking into account that food systems differ greatly both across and within regional and national circumstances, promoting sustainable diets provides a strategic and unique added value to the SFS Programme, as it can foster the involvement of key stakeholders and food system actors.

\(^{48}\) In particular to the SDG2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) and SDG12 (Ensure sustainable consumption and production patterns), as well as poverty (SDG1), health (SDG3), climate change (SDG13), land degradation and biodiversity (SDG15).\(^{49}\)

\(^{49}\) In particular the 3rd “Enhance sustainable food systems”

\(^{50}\) UNSCN, Sustainable Diets for Healthy People and a Healthy Planet, 2017, Rome.

The SFS Programme currently has two core initiatives under its focus theme “sustainable diets”. One is jointly led by FAO and UN Environment, and aims to improve the evidence base by developing guidelines for assessing sustainable diets in the context of sustainable food systems, including by identifying trends and drivers for the development of a multidisciplinary framework on sustainable diets. The other one – under the joint leadership of Costa Rica, Hivos, IFOAM – Organics International, CACORE and INBio – focuses on promoting healthy and sustainable gastronomy as a driver of agriculture development and for strengthening diversified family farming systems, initially in Costa Rica, however a view to be replicated in other countries.

2.2.2. Sustainable Value Chains

**Definition:**
A *food value chain* (FVC) consists of all the stakeholders who participate in the coordinated production and value-adding activities that are needed to make food products reach consumers.

A *sustainable food value chain* is a food value chain that:
- is profitable throughout all of its stages (economic sustainability);
- has broad-based benefits for society (social sustainability);
- has a positive or neutral impact on the natural environment (environmental sustainability)

The SFVC concept recognizes that value chains are dynamic, market-driven systems in which vertical coordination (governance) is the central dimension and for which value added and sustainability are explicit, multidimensional performance measures, assessed at the aggregate level.

Food value chains are considered primarily to be an analytical approach to understanding how supply chains work in practice and how they can be influenced to achieve desired outcomes (e.g., value-addition, producer upgrading, equitable trading relations or sustainability). In a sustainable food systems approach, they are considered as the core ‘productive’ activities of the food system.

Three approaches brought the concept of a food value chain into policy discussions:

1) In the 1960s, the French *filière* approach mapped and calculated the socioeconomic

---

52 For more information see: http://www.oneplanetnetwork.org/initiative/sustainable-diets-context-sustainable-food-systems-core
53 For more information see: http://www.oneplanetnetwork.org/initiative/sustainable-and-healthy-gastronomy-key-driver-sustainable-food-systems-core
54 Adapted from FAO, *Developing Sustainable Food Value Chains: Guiding Principles*, 2014
56 This section is based on the following reference: Loconto, A. Santacoloma, P. Vandecandelaere, E., Azofeifa, R. and F. Tartanac. 2018. “Sustainability along all value chains: exploring value chain interactions in sustainable
characteristics of agro-enterprises and the monetary value of product flows from production to consumption. 57) In the 1980s, Immanuel Wallerstein’s world system’s theory, 58 was further developed to analyze tropical commodity systems 59 in order to understand sociological questions of power and exploitation in these long chains. 3) The term ‘value chain’ was coined by Micheal Porter 60 as a management tool that could help firms first to identify and then exploit their competitive advantage within an industry, then to ‘create shared value’ among supply chain actors. 61

One way to promote sustainability in the food system along the food value chain is through green value chains. These are value chains where environmental and social indicators are taken into consideration in determining the sustainability of the supply chain. 62 They range from closed-loop supply chains that reduce their environmental footprint by recycling the used products back through the chain, 63 creating circular economies; 64 to sustainable sourcing strategies that focuses on the purchasing of certified raw materials where the ‘value’ of sustainability is certified by a third-party. 65

---

2.2.2.1. The Sustainable Food Value Chains Approach

**Definition:**
*The Sustainable Food Value Chains Approach* addresses the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad based benefits for society and does not permanently deplete natural resources.\(^{66}\)

A further way to make use of the food value chain to implement sustainability in the food system is to consider it systemically, as in the FAO’s sustainable food value chain approach.\(^{67}\) This approach places the value chain at the heart of a system of complex environments that determines the behaviour and performance of farms and other agri-food enterprises. This vision implies that the chain is not only a logistical structure as some of the more instrumentalist approaches propose, but rather a chain of relationships where different actors along the chain are adding value as the product moves from one actor to the next within a food system. This approach provides a roadmap from which to trace the actors who, through different nodes of negotiation, are involved in creating values throughout the chain.\(^{68}\) FAO’s approach also highlights the importance of institutional and intermediary actors who enable value chain actors to engage in their value-adding activities, such as banks, extension workers, government agencies, etc.

More recently, the concept of *circuit court*\(^{69}\) or short food supply chains has emerged to try to capture how proximity (geographic or shared values) is often a common denominator in creating a strong linkages between consumers and producers that contributes to the sustainability of the food system.\(^{70}\) Proximity is seen as a starting point for the collective construction of a new vision and identity around food production and consumption for urban communities.\(^{71}\) Proximity has also been shown to have positive effects on reinforcing site-specific cultural identity and the ability of local actors to be actively engaged in new

---

\(^{66}\) FAO, *Developing sustainable food value chains*, 2014, p. 6

\(^{67}\) FAO, *Developing sustainable food value chains*, 2014


forms of food citizenship,\textsuperscript{72} such as community-supported agriculture,\textsuperscript{73} or consumer-driven food initiatives.\textsuperscript{74} The construction of geographical or social/institutional proximity in food systems implies building conscious relationships between producers, consumers and other intermediary actors who are increasingly fundamental in ensuring that sustainable production and consumption activities can meet.\textsuperscript{75} These approaches move out of a linear focus on one product or commodity towards ‘baskets of goods’ that offer diverse food options for closely linked consumers and producers.

Thus, creating sustainable food value chains is seen as a core function of a sustainable food system. In addition, a sustainable food systems approach will look beyond individual value chains in order to gain a more comprehensive and systemic understanding of the dynamic horizontal relationships that emerge as actors who are participating in individual value chains begin to interact in new relationships that add value to their food systems.

There are many similarities between the Sustainable Food Value Chain Approach and the Sustainable Food Systems Approach. Both approaches cover all three dimensions of sustainable development and seek to promote sustainability along the entire food value chain. However, while the Sustainable Value Chain Approach looks at individual value chains (e.g. carrots or beef), the Sustainable Food Systems Approach considers food systems in their totality, taking into account all relevant causal variables of a problem and all social, environmental, and economic impacts of the solutions to achieve transformational systemic changes. Furthermore, the Sustainable Food Systems Approach also aims to act on the consumer side (i.e. by improving consumer information and through awareness raising campaigns) – recognizing consumption as an additional entry point to bring about more sustainable production patterns, further to interventions along the different stages of the actual value chain.

The SFS Programme currently has two core initiatives under its focus theme “sustainability along all food value chains”. One is led by FAO, and focuses on linking small-scale producers and consumers, including by mapping local and territorial markets and

promoting a participatory approach with value chains intermediaries among producers.\textsuperscript{76} The other one – implemented under the lead of Nestlé, the Global Nature Fund and IFOAM – Organics International – aims to develop better biodiversity standards and valuation methods, with the objective to motivate companies to use these tools in order to increase the biodiversity performance of the food sector.\textsuperscript{77}

2.2.3. \textit{Food Losses and Waste}

\begin{table}[h]
\centering
\begin{tabular}{|p{0.9\textwidth}|}
\hline
\textbf{Definition:} \\
\hline
\textbf{Food loss and waste} (FLW) refers to a decrease, at all stages of the food chain from harvest to consumption in mass, of food that was originally intended for human consumption, regardless of the cause. \\
\textbf{Food losses} (FL) refers to a decrease, at all stages of the food chain prior to the consumer level, in mass, of food that was originally intended for human consumption, regardless of the cause. \\
\textbf{Food waste} (FW) refers to food appropriate for human consumption being discarded or left to spoil at consumer level – regardless of the cause. \\
\textbf{Food quality loss or waste} (FQLW) refers to the decrease of a quality attribute of food (nutrition, aspect, etc.), linked to the degradation of the product, at all stages of the food chain from harvest to consumption.\textsuperscript{78}

Food waste can be classified into three categories\textsuperscript{79}; \\
1) \textbf{Avoidable losses:} refers to food and drink thrown away because it is not used, e.g. they have exceeded their expiry date. Most avoidable losses are composed of foods that were, at one time not edible prior to disposal. A proportion of the food has deteriorated and become inedible at the time of disposal e.g. decomposed. \\
2) \textbf{Possibly avoidable losses:} refers to food that people discard e.g. apple peels or bread crusts that can be eaten, or that can be eaten if prepared in a way that makes them consumable e.g. potato skins, or are edible but discarded as they do not meet aesthetic criteria e.g. crooked carrots.\textsuperscript{80} \\
3) \textbf{Unavoidable losses:} includes waste from food and preparations which cannot be eaten under normal circumstances e.g. apple cores, banana or orange peels, tea leaves, coffee grounds and egg shells. In addition, losses related to harvesting, storage, transport and treatment which cannot be avoided by using the best technologies available and within reasonable additional costs are also classified as unavoidable.\textsuperscript{81}

\hline
\end{tabular}
\end{table}

\textsuperscript{76} For more information see: http://www.oneplanetnetwork.org/initiative/sustainability-along-all-value-chains-identifying-and-promoting-local-initiatives-linking
\textsuperscript{77} For more information see: http://www.oneplanetnetwork.org/initiative/complementing-existing-value-chain-sustainability-assessments-measuring-communicating-and
\textsuperscript{78} HLPE, Food losses and waste in the context of sustainable food systems, 2014
\textsuperscript{80} In addition, the SFS Programme acknowledges that further reasons for food waste may exist that are potentially avoidable, such as food that is discarded due to cultural habits (e.g. beet greens).
\textsuperscript{81} The SFS Programme acknowledges that as technology tends to improve, losses that are unavoidable in the present may become avoidable in the future.
The concept (and associated definitions) of food loss and waste is central to the sustainable food systems debate, as it occurs in significant volumes along all parts of the food value chain thereby exacerbating an unsustainable food chain. Thus, there is much need to seek ways and levers to inform and catalyze food loss and waste activities. Reducing food waste globally by 50 percent is one of the core targets of the 2030 Agenda for Sustainable Development, notably 12.3 which seeks to reduce food waste globally by 50 percent by 2030, and the One Planet SFS Programme addresses the reduction of food losses and waste as one of its five focus themes.

Food waste does not only equate to mass (volume) of food lost through the supply chain, but further approaches have been formulated to equate the loss with monetary (economic loss), nutritional and calorific value, as well as environmental losses e.g. water, carbon biodiversity and land. It should be noted that many global and regional figures referenced are derived from a seminal piece of work carried out by the FAO in 2011-2012\(^\text{82}\). To illustrate the estimated global scale, and therefore significance to the SFS Programme, the following example losses are listed below as per key indicators:

- **Monetary loss (global):** US$ 1 trillion\(^\text{83}\)
- **Nutritional loss at American retail and consumer levels (reflected as per capital per day):** 1,217 kcal, 33 g protein, 5.9 g dietary fiber, 1.7 mcg vitamin D, 286 mg calcium, and 880 mg potassium\(^\text{84}\).
- **Carbon loss (global):** 3.6 gigatonnes CO\(_2\) eq (excl. land use change) – if food waste were a country, it would be the third largest emitter of CO\(_2\) in the world\(^\text{85}\).
- **Water consumption (blue) loss (global):** 250km\(^3\) – equivalent to 3.6 times the blue water footprint of total USA consumption\(^\text{86}\).

Our level of understanding on the global, country, regional and local-level of food loss and waste is still in its infancy, with either *ad hoc* studies on particular areas of interest or focus (such as a particular food chain, or stage in the food chain) or it is high-level or aggregated at a regional level. For example, waste data for South Africa has been derived from FAO’s data on sub-Saharan Africa. Whilst a start, this is not an accurate reflection on food waste in the country. However a clear opportunity has arisen with the adoption of the 2030 Agenda. SDG 12.3 calls member states to ‘halve per capita global food waste at the retail and consumer

---

\(^{82}\) Gustavsson et al, *Global food losses and food waste*, 2011


levels and reduce food losses along production and supply chains, including post-harvest losses’ by 2030. Both FAO and UN Environment are leading efforts to develop methodologies to measure SDG 12.3’s progress, including through the SFS Programme’s core initiative “Delivering SDG Target 12.3 on Food Loss and Waste Reduction”. The Food Loss Index led by the FAO focuses on food that is lost from harvest to processing and the Food Waste Index led by UN Environment focuses on consumer and retail waste. Together with alliances like Champions 12.3 that are helping to galvanize private sector action on food loss and waste, the emphasis on better understanding food loss and waste globally at a national-level is gaining traction.

In addition to this upward trend in wanting to better understand the actual and unique dynamics of food loss and waste generation at a national level, there appears to also be a shift in some of the terminology and/or widening of the scope of indicators. For example, for those conducting food waste research in the field, the term ‘waste’ is problematic and can hinder access to data, however by shifting the discourse to ‘surplus’ food a more positive and proactive dimension is added to the debate. From the perspective of indicators, increasingly the nutritional value of the food that goes to waste is being understood. This is particularly useful in countries that suffer from food insecurity or nutritionally poor diets. How, for example, could surplus food, with a good nutritional value, be distributed to those in need? Seminal work in this area has been done by John Hopkins University in the United States.

The SFS Programme currently has one core initiative under its focus theme “reduction of food losses and waste”, which is jointly led by FAO and UN Environment and entitled “Delivering SDG Target 12.3 on Food Loss and Waste Reduction”. The initiative seeks to take stock of the current state of knowledge and on-going methodological activities, share approaches and promote harmonization of FLW measurement around SDG 12.3. More concretely, it promotes the development of a Community of Practice on Food Waste, awareness raising and communication activities, as well as the development of a methodology for measuring food waste in the context of SDG 12.3.

---

87 WRI, Champions 12.3 https://champions123.org/
88 Spiker et al, Wasted Food, Wasted Nutrients: Nutrient Loss from Wasted Food in the United States and Comparison to Gaps in Dietary Intake, 2017
2.2.4. Resilient Production Systems

Definition:

Resilience refers to the ability of a system to prevent disasters and crises as well as to anticipate, absorb, accommodate or recover from them in a timely, efficient and sustainable manner. It can refer to livelihoods, ecosystems, production systems, organizations, etc. It includes, for instance, protecting, restoring and improving livelihoods systems in the face of threats that impact agriculture, nutrition, food security and food safety. Typically, resilient systems show a capacity to be flexible, agile and able to cope with change in an effective manner.

In the context of agricultural production systems, resilience can be defined as the capacity of agro-ecosystems, farming communities, households or individuals to maintain or enhance system productivity by preventing, mitigating or coping with risks, adapting to change, and recovering from shocks.

The concept of resilient production systems is particularly relevant in a food systems perspective. Phenomena such as climate variability, extreme weather events and market volatility, as well as civil strife and political instability, impair the productivity and stability of agricultural production systems, which in turn increases uncertainties and risk for producers, and translates into disruptions in the value chain.

Food production systems are coming under increasing pressure to produce enough food to feed a global population, respond adequately to complex global change and ensure food supply is secure, yet decrease their environmental impacts. Given that the production of food is one of the most impactful activities on water, land and biodiversity it is therefore critical that the interplay between human welfare, production and natural resources are in balance and can adapt to shocks. Where this is not the case, for example following extreme climate events such as flooding and drought, it translates into impacts on ecosystems and people, both producers and consumers, with disruptions in markets, and increased food price volatility that affect both producers and consumers, in particular the most vulnerable and food insecure part of the population.

Given this interplay and broad implications and requirements, the ambitions for achieving more resilient food production systems therefore encapsulates and aligns with a number of the SDGs, notably: SDG 1 (no poverty), 2 (zero hunger), 3 (good health and well-being), 6

---


91 Heinicke, M. Implementation of Resilient Production Systems by Production Control. 2014

(water for all), 11 (sustainable cities and communities), 12 (responsible consumption and production), 13 (climate action) and 15 (life on land).

Policies, technologies and practices that build producers’ resilience to risks and uncertainties contribute to sustainable production systems. They can include building flexibility in programmes and policies, developing risk management strategies, and specific measures such as flexible fishing strategies, the introduction of pest-resistant varieties and breeds, improved market governance, social safety nets, insurance and credit. Strategies to foster more resilient production systems also include integrating gender equity and social justice into agriculture and food security research and initiatives; promoting production systems that make better use of ecological processes rather than relying exclusively on external inputs for agricultural production; fostering diversified production systems; encouraging local food markets, distribution networks and waste reduction; and better linking nutrition, social protection and agricultural production policies.

The adoption of resilient food production systems can occur at a multiple-levels, such as national, regional, locally, within sectors and organizations. Collaborative holistic policies, institutions and technologies that recognize the complexity of the system and interlinkages can aid the design and implementation of more resilient production systems. Such systems are usually based on the concept of a circular economy, with models that involve reuse and recycling thereby reducing the dependency on external inputs and exposure to external shocks. This in conjunction with the actors within the food systems being clear about and understanding the implications and possibilities to do good by their actions.93

The SFS Programme currently has two core initiatives under its focus theme “resilient, inclusive and diverse production systems”. One is being jointly implemented by FAO and UN Environment, and focuses on increasing understanding of barriers to the adoption of more sustainable production practices, as well as on improving coordination of incentives to help food system actors overcome such barriers.94 The other one – jointly led by IFOAM – Organics International, FQH and Beras – promotes the development the organic food sector as a pilot model and living laboratory for sustainable food systems, using the organic food system as a model to identify, understand and describe transformation processes towards sustainable food systems.95

In addition, a number of further One Planet Network initiatives illustrate and/or respond to the practice of creating resilient production systems, such as:

93 IIED. Building Resilient Food Systems. 2010.
94 For more information see: http://www.oneplanetnetwork.org/initiative/sustainable-food-systems-whats-it-farmers-core
95 For more information see: http://www.oneplanetnetwork.org/initiative/organic-food-system-program-ofsp-organic-food-systems-models-and-living-laboratories
• Building Climate Resilient Farming Communities in Cambodia.\textsuperscript{96}
• Climate and Sustainable Livelihood Initiatives in Odisha, India.\textsuperscript{97}
• The declaration of Abu Dhabi for Global Food Security through Good Agricultural Practices – of which an element is to support farms to become more sustainable and resilient.\textsuperscript{98}
• IFAD Rural Growth Programme, Yemen – to reduce poverty and food insecurity in rural areas and to increase the climate resilience of small farmers.\textsuperscript{99}

\textsuperscript{96} www.oneplanetnetwork.org/initiative/cedac-building-climate-resilient-farming-communities-cambodia-bcr
\textsuperscript{97} www.oneplanetnetwork.org/initiative/fair-climate-and-sustainable-livelihood-initiatives-odisha
\textsuperscript{98} www.oneplanetnetwork.org/initiative/declaration-abu-dhabi-global-food-security-through-good-agricultural-practices
\textsuperscript{99} www.oneplanetnetwork.org/initiative/ifad-rural-growth-programme-rgp
3. Different Roads leading to Sustainability

This chapter provides an overview of approaches that are currently being widely promoted and that can contribute to the Sustainable Food Systems Approach, and some of which are sometimes (mistakenly) almost used as synonyms by certain actors. The aim of the chapter is to shed light into the nuances by addressing questions such as ‘what is the difference between the Sustainable Food Systems Approach and Agroecology’? While some of these approaches may cover only a subset of the dimensions and elements of the food system, the chapter shows that they all contribute towards more sustainable food systems, particularly when put in the context of the broader Sustainable Food Systems Approach.

3.1. Selected key approaches and their relation to sustainable food systems

3.1.1. Sustainable Intensification

**Definition:**
While there is no agreed definition on sustainable intensification, there is broad consensus that it refers to a process where agricultural productivity is increased while maintaining or improving environmental outcomes.\(^{100}\)

The FAO defines sustainable crop production intensification as production that "provides opportunities for optimizing crop production per unit area, taking into consideration the range of sustainability aspects including potential and/or real social, political, economic and environmental impacts."\(^{101}\)

The concept of sustainable intensification was developed primarily in relation to crop production, and further broadened to the whole agricultural production systems. It was developed in response to the need to address the issue of feeding a growing population while mitigating the negative environmental impacts of agriculture. Sustainable intensification looks at whole landscapes, territories and ecosystems to optimize resource utilization and management. Through sustainable intensification, farmers produce more from the same area of land (or from the same volume of water) and use fewer inputs while producing greater yields.\(^{102}\)

In a world with growing pressure on resources, sustainable intensification of agriculture is critical in achieving both social and environmental goals. By producing more with less, in


particular less land, it reduces encroachment on natural systems, including forests, and limits the need for expanding agricultural land. By better using inputs like water, energy or chemicals, it reduces the negative environmental impacts of agriculture.

The concept of sustainable intensification does not prescribe any particular vision or method of agricultural production. There is no pre-determined technology package, species mix or cookie-cutter design applications. However, this does by no means imply that sustainable intensification is “business as usual” agriculture. As observed by Godfray (2015): “Sustainable intensification if treated seriously is genuinely radical. It is not a smorgasbord of interventions that can be chosen at will to justify different farming methods and philosophies. It is a coherent program that seeks radical change in the way food is produced and which places as much weight on improving environmental sustainability as on economic efficiency. It should not be seen as business-as-usual with marginal improvements that benefit the environment, nor as a call for a purely environmental agenda that fails to acknowledge the need to meet people’s expectations for affordable, nutritious and varied food.”

Sustainable intensification emphasizes the outcomes of production – that is both more food and improved environmental goods and services. While no particular method of production is prescribed, a number of specific agronomic techniques are associated with sustainable intensification, like conservation agriculture, precision agriculture, integrated pest management, integrated soil fertility management and the move towards more integrated production systems. All of these have the potential to contribute to the principle of producing more with less. It should be noted that the concept of sustainable intensification focuses exclusively on the production side of food systems.

Sustainable Intensification and the Sustainable Food Systems Approach have in common that they both address all three dimensions of sustainable development. However, while Sustainable Intensification focuses on agricultural production, including productivity increases coupled with improvements in resource efficiency, the Sustainable Food Systems Approach aims to promote the three sustainability dimensions in all food systems activities and outcomes. Depending on the socio-economic context of any given food system, this may not necessarily be linked to increases in production.

3.1.2. Ecosystem Approach and Agroecology

Definitions:

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment, and recognizes that humans, with their cultural diversity, are an integral component of ecosystems.\(^{105}\)

Agroecology is a scientific discipline, a set of practices and a social movement.\(^{106}\) As a science, it studies how different components of the agroecosystem interact. As a set of practices, it seeks sustainable farming systems that optimize and stabilize production, through enhanced use of ecosystem services and limited use of external inputs. As a social movement, it pursues multifunctional roles for agriculture, promotes social justice, nurtures identity and culture, and strengthens the economic viability of rural areas.\(^{107}\) Agroecology is an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems.\(^{108}\)

10 elements of Agroecology\(^ {109}\) have been identified:

- Diversity
- Synergies
- Efficiency
- Resilience
- Recycling
- Co-creation and sharing of knowledge (describing common characteristics of agroecological systems, foundational practices and innovation approaches)
- Human and social values
- Culture and food traditions (context features)
- Responsible governance
- Circular and solidarity economy (enabling environment)

The ecosystem approach and the agroecological approach have been developed in response to unsustainable use of natural resources. They are both promoting holistic, integrated and long term sustainable strategies to the management of agroecosystems. In a food systems perspective, these two approaches contribute mainly to the development of sustainable agricultural production practices, however their main focus is not productivity as they cover the environmental dimension in particular and place agriculture and people within the perspective of ecosystems.


As the primary framework for action under the Convention on Biological Diversity (CBD), the ecosystem approach has a strong focus on the conservation and sustainable use of biodiversity, management of ecosystem services, optimization of ecological interactions and resilience. It comprises 12 Principles\textsuperscript{110}, which share many similarities with the elements of Agroecology (see properties of agroecological systems and foundational practices). The overall consideration for reducing environmental impacts are complementary to other SFS related concepts and approaches, including resilient production systems (see 2.2.4.) and sustainable intensification (see 3.1.1.).

A further point that the two approaches have in common is that they recognize the importance of considering all forms of relevant information, including scientific as well as indigenous and local knowledge, innovations and practices. They are also both based on the idea that solutions are context-dependent and management should be decentralized to the lowest appropriate level.

The ecosystem approach is not restricted to agriculture; it can be applied to forest management, integrated river-basin management and integrated landscape management. Thus, its scope is beyond food and agriculture. It does not prescribe any specific agricultural practices. The ecosystem approach mainly offers broad management guidelines to deal with complex systems, such as adaptive management principles or considering various temporal and spatial scales.

Agroecology, however, has agriculture and in particular family farmers at its heart, including smallholder farmers, indigenous peoples, and rural communities.\textsuperscript{111} Many agricultural systems that are included in sustainable intensification approaches integrate agroecological principles, including organic, permaculture, biodynamic, agroforestry, or integrated grazing/animal management, etc. Nevertheless, agroecology seeks a whole redesign of agro-ecosystems to eliminate the root causes of problems in an integrative way, rather than a marginal improvement or substitution of current practices\textsuperscript{112}. Furthermore, agroecology aims to empower producers and communities as key agents of change.

Besides, its strong social and cultural perspective differentiates agroecology from other ecological and sustainable intensification approaches.\textsuperscript{113} Even though there is a broad


\textsuperscript{111} FAO (2018) FAO'S work on agroecology: A pathway to achieving the SDGs, Rome, Italy. 28p


variety of agroecological social movements and discourses, community-based dynamic, greater connection between producer and consumer, or defense of food sovereignty and farmer’s rights are often promoted.

The lack of a precise definition of agroecological movements or practices can still create confusion among scientists, practitioners and the public, and limits the creation of a coherent and unified movement. Finally, we can mention some efforts to extend the concept to a broader food systems approach. An important example is the current movement within agroecology to shorten supply chains, with growing networks of farmers’ markets, community supported agriculture schemes, consumer cooperatives, and other more direct marketing arrangements that bypass industrial models (including processing and selling).

Similar to Sustainable Intensification, Agroecology and Ecosystem Approaches have in common with the Sustainable Food Systems Approach that they address all three dimensions of sustainable development. However, Agroecology has a particularly strong social / cultural dimension relative to the other dimensions, and with regard to food systems activities it addresses mainly agricultural production plus some elements of short value chain development, whereas the Sustainable Food Systems Approach aims to address production patterns from the consumption entry point and vice versa.

3.1.3. Territorial Approaches

<table>
<thead>
<tr>
<th>Definition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>While there is no one, single definition territorial approaches can be described as addressing the development of multiple sectors, implemented by a range of stakeholders and structured by multi-level governance.</td>
</tr>
</tbody>
</table>

- Focus on poverty and inequalities: recognizes that all regions have development potential, not only urban areas.
- Area-based: starting point is the economy, aims to capitalize on the strengths inherent in a territory so that locally-based products and services drive development.
- Scale: determined by the social and economic make-up of a given territory; management is inclusive and starts at the grass-roots level to evolve into the multi-level governance network.
- Key activities: territorial analysis, livelihood analysis, negotiation, consensus building, conflict resolution, consultation.115

The territorial approach to rural development referred to here is a socio-economic means to “(1) derive added value from locally under-used resources relative to current potential, (2) integrate rural and urban activities in a territorial dimension centered around regional economic projects, and (3) incorporate the rural poor into the employment and investment opportunities created by local growth.”

In general, this approach is a territorial planning tool. It is a “public intervention which builds on local capabilities and promote innovative ideas through the interaction of local and general knowledge and of endogenous and exogenous actors.” As an approach, it combines: “(i) institutional development to promote consultations among local and external agents, and include poor people in production transformation processes and benefits; and (ii) production transformation to link the territory's economy with dynamic markets.” The focus is on better linking urban and rural areas in a comprehensive development of a territory (including both more rural and more urban areas in a defined space), at the same time as addressing the development of multiple sectors, implemented by a range of stakeholders and structured by multi-level governance – or governance that involves coordination between local, regional and national level authorities and stakeholders.

Box 3: The City-Region Food System Approach as a specific type of territorial approach

As a specific type of territorial approach, the city-region food system (CRFS) approach provides a critical lens for analysis while supporting on-the-ground policy transformation and implementation. Working at city-region level can leverage the complexity of rural-urban linkages to a practical level by making food the common denominator. This implies that broader issues (i.e. human rights, climate change and resilience) can be addressed in a more focused manner. Improved city-region food systems will help achieve better economic, social and environmental conditions in both urban and nearby rural areas, as it facilitates:

- Access to affordable and nutritious traded foods from local and regional producers that will improve consumer food security and nutrition and will enhance transparency in the food chain.
- Access to markets and support to alternative markets (i.e. farmers’ markets, community supported agriculture) that will improve livelihoods of both small-scale and larger scale producers.
- Local and regional food hubs and shorter value chains, and more broadly, efficient and functioning agricultural supply chains that link hinterland producers to market systems.

---

and that can contribute to sustainable diets, reduce food waste along the chain and stabilizing livelihoods in distribution, processing and manufacture of food and fibre products.
- That water, nutrients and energy can be resourced, recovered and reused in agricultural production.
- That participatory governance structures are created to include stakeholders from multiple sectors, from both urban and rural areas”

The concept of territory, used in territorial approaches, thus derives from the concept first articulated in French, Italian, Spanish and Portuguese, of an area of land that has been inhabited by a people who have traditionally practiced an identifiable form of agriculture and agro-industry (processing and value addition) that is economically, socially and culturally tied to this geo-political space. Thus, the notion of a territory goes beyond its English definition that denotes only the geographic area to include the agroecosystems, people, economy and socio-cultural practices of that space. In this sense, it is closely linked to the French notion of ‘terroir’.

A well-established approach to territorial development has been the promotion of geographical indications (GIs), which have been shown to deliver positive economic and social impacts on rural development, such as increasing production, employment, food system resilience and sociocultural sustainability. GIs primarily differentiate and add value to products with specific characteristics, qualities or reputation resulting essentially from their geographical origin and protect both consumers and producers’ from misuse of the territorial name, while they also contribute to the preservation of public goods. Collective action is at the heart of GI processes whereby producers and the local community are able to organize themselves around a local identity and heritage. Local producers elaborate their GI product specifications, allowing the rules to be adapted to local conditions (natural and human resources) instead of being imposed by downstream segments of the value chain. Producer organizations that develop GIs have also demonstrated an important dynamism that supports environmental conservation at the landscape level of their territory (‘terroir’) and promotes local culture and gastronomy.

---

In sum, applied to sustainable food systems a territorial approach would be a collective planning process that takes into account all stages from food production to consumption occurring in a given territory. It would involve looking at food systems in a holistic, cross-sectoral manner, at the sub-national level (metropolitan, rural adjacent, and remote rural spaces) in order to develop strategies that can more sustainably develop the territory.\footnote{http://www.fao.org/3/a-bl336e.pdf, p. 36 etc.}

While they both address all three dimensions of sustainable development, compared to the Sustainable Food Systems Approach, Territorial Approaches have a relatively stronger focus on the social and economic dimensions. Territorial Approaches have and the Sustainable Food Systems Approach have in common that they both promote multi-stakeholder involvement. Furthermore, both approaches seek to promote sustainability along the entire food value chain, however the Sustainable Food Systems Approach establishes more direct links between consumption and production patterns, while Territorial Approaches cover consumers in a more indirect way similar to the Sustainable Food Value Chain Approach.

3.1.4. Public health approaches

**Definition:**

**Public health approaches** to food systems focus on studying (i) human health as a result of food quality and safety across the chain from primary production and its impact on potable water, air quality, and food quality, to the final products’ nutritional profile/density; and (ii) consumer awareness, behaviors, and education, including personal dietary choices, often within the context of cultural traditions, and the compound effects of these factors on individual and population health.

Public health approaches build on the ‘One Health’ approach which is defined as “an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

The areas of work in which a One Health approach is particularly relevant include food safety, the control of zoonoses (diseases that can spread between animals and humans, such as flu, rabies and Rift Valley Fever), and combatting antibiotic resistance (when bacteria change after being exposed to antibiotics and become more difficult to treat).”\footnote{http://www.who.int/features/qa/one-health/en/}

The health of individuals and the broader society to which they belong is inexorably linked and intertwined with the health of the food production system from primary
production through processing and distribution. Attainment of a sustainable food system can be approached from “either end” of the production-consumption loop, depending on the interests and potential contributions possible by different players in the system. In any case, from an anthropocentric viewpoint true sustainability and health are at least interconnected and interdependent, if not inseparable, which in the context of food systems is reflected in the definition of sustainable diets (see 2.2.1.).

The SDGs could be distilled into a few main outcomes in terms of such an anthropocentric approach – namely, food that is healthy for people and the planet, in a way that provides healthy and sustainable livelihoods to all those involved in any given system.

In a public health based approach to food systems, the entry point is through studying and engaging the act and effects of consumption and the preceding steps that enable that to happen. What kind of food is provided – namely the quality (i.e. product nutritional profile, nutrient density, safety risk factors such as toxic residues or pathogens), diversity (completeness of diet provided overall, and related excesses or deficiencies), and the steps needed to get it to the eater must be considered. Eaters can only choose to eat that which is actually available and affordable for them to choose.

Health effects extend beyond just the direct act of eating. Indirect effects of the surrounding environment and conditions under which the food is produced, processed, and distributed also contribute to individual and public health in positive or negative ways. For example, drinking water supplies polluted by toxic agricultural chemicals or effluent form confined animal feed operations, air contaminated by pesticides or too-concentrated emissions from livestock also pose public health threats. Packaging materials accumulate and/or break down in the environment and threaten the health of soils, water supplies, and marine life, as well as potentially pose threats from migration of packaging material components into the food itself; the manufacturing of packaging materials can also have localized negative environmental effects that impact communities.

Non-communicable diseases are on the rise, considered to be a result of a combination of dietary, environmental, and cultural factors, the balance of such factors dependent on the disease in question and particular circumstances of the person(s) involved. Food that provides calories lacking adequate nutrient density – due to impoverished soils, over-processing, unbalanced genetics, or some combination of these – are also topics of study from a public health perspective. Furthermore, the health effects of diet – of eating habits – needs to be taken broader than the analysis of the qualities of individual products and the systems that make them, to a holistic synthetic picture of what constitutes a “complete”, sustainable diet for any given individual or population, and to the production system that provides the diet in question.
Health is a multidimensional phenomenon, with biological, emotional, mental, and spiritual facets, and as such must be addressed through a lens that is as much anthropological as it is biochemical. Nonetheless and despite this complexity, a public health based approach to studying and implementation of sustainable food systems can reveal significant guidelines for correcting more or less obvious detriments and reinforcing positive behaviors across the spectrum of production and consumption practices.

Similar to Sustainable Intensification as well as Agroecology and Ecosystem Approaches, public health approaches have in common with the Sustainable Food Systems Approach that they address all three dimensions of sustainable development. In addition, public health approaches also looks at food systems at all possible scales and all food systems activities, including also consumption. However, public health approaches have a particularly strong social / health dimension relative to the other dimensions of sustainable development.

3.2. An illustration of interlinkages, overlaps and complementarities

The below table compares the Sustainable Food Systems Approach to the other related approaches described under 3.1. The table illustrates that all these approaches contribute towards making food systems more sustainable. However, some of them may pay particular attention to one sustainability dimension relative to the others, or they may focus on specific food systems activities as entry points, which for some of them are located more on the production side and not necessarily linking all production and consumption. For example, the Sustainable Food Value Chain Approach can be useful in addressing sustainability along the entire food value chain as it considers the relationships between value chain actors, yet there is scope to complement it with a Sustainable Food Systems Approach in order to allow for consumption as an additional entry point. Sustainable Intensification, to name another example, also has a lot to contribute towards promoting sustainability in food systems, however its sole entry point lies in primary production. Adopting Sustainable Intensification principles in alignment with a broader Sustainable Food Systems Approach can allow to broaden the spectrum of entry points to further food systems elements.

The Sustainable Food Systems Approach looks at food systems through a truly holistic lens, thereby substantiating the potential for food systems transformation of the nature and scale needed to meet global challenges and achieve the global goals of the 2030 Agenda for Sustainable Development. All the other approaches can also be important drivers towards more sustainable food systems, in particular if implemented with a food systems lens.

---

127 As well as the Sustainable Food Value Chains Approach described in 2.2.2.1.
Table 1: Comparison between the seven approaches in relation to sustainable food systems highlighted in this publication

<table>
<thead>
<tr>
<th>Main sustainability dimension(s) addressed</th>
<th>Sustainable Food Systems Approach</th>
<th>Sustainable Food Value Chain Approach</th>
<th>Sustainable Intensification</th>
<th>Agroecology</th>
<th>Ecosystems Approach</th>
<th>Territorial Approaches</th>
<th>Public health approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic, social &amp; environmental</td>
<td>Economic, social &amp; environmental</td>
<td>Economic, social &amp; environmental (+political)</td>
<td>Economic, social &amp; environmental (+political)</td>
<td>Economic, social &amp; environmental</td>
<td>Primary focus on environmental dimension</td>
<td>Primary focus on social and economic dimensions</td>
<td>Primary focus on social dimension (i.e. health)</td>
</tr>
</tbody>
</table>

| Main food systems elements addressed | All food system activities | All food system elements | Market opportunities, income distribution, social norms & values, consumer information, traditional knowledge, natural resources, biodiversity | Population growth, natural resources, biodiversity, market opportunities | Natural resources, ecosystem services, biodiversity, market opportunities, income distribution, social norms and values, traditional knowledge | Social norms and values, consumer information, behaviour and trends, education, health |

| Main food systems outcomes addressed | All food systems outcomes | Entire food systems | Food security & nutrition (especially availability), resource efficiency, conservation & sustainable use of biodiversity, climate change mitigation, profitability for farmers & living wages, economic development | Food security & nutrition (especially availability), resource efficiency, profitability for farmers | Ecosystem services, conservation & sustainable use of biodiversity, climate change mitigation, resilience & climate change adaptation, livelihoods & wellbeing, social justice & equality, poverty alleviation | Livelihoods & wellbeing, social justice & equality, economic development & poverty alleviation | Food security & nutrition (especially utilization), human health |

| Level of analysis | Entire food systems | Entire food systems | Landscapes, territory, ecosystems | Agro-ecosystems | Ecosystems | Territory | Entire food systems |

128 However, as a social movement the focus of agroecology goes beyond purely primary production. There are several examples of agroecological movements that aim to bring producers and consumers closer together, e.g. by promoting short value chains, community-supported agriculture and farmers markets.

129 However, the ecosystem approach goes beyond agriculture, covering also forests, rivers-basins, landscapes, etc.

130 However, goes beyond these production-side activities by linking them to the consumption side by promoting, *inter alia*, short value chains, community-supported agriculture, farmers markets and geographic indications.

131 As per food systems elements provided in figure 1.

132 As per food systems outcomes provided in figure 1.

133 However, the Sustainable Food Value Chain Approach focuses on individual value chains.

134 This includes sub-national as well as local urban-rural areas, combining agro-ecosystems, people, the economy as well as socio-cultural practices.
3.3. Main strategies to promote sustainable food systems

While the Sustainable Food Systems Approach described in section 2.1. as well as the different approaches described in section 3.1. above elaborate multiple avenues for stakeholders to contribute to the development and implementation of sustainable food systems, the following strategies are theoretically possible to implement for any given approach – and would ideally be executed simultaneously in a complementary fashion. The Sustainable Food Systems Approach as promoted by the One Planet SFS Programme makes use of all these strategies, as described in box 4 below.

Multi-stakeholder engagement

Systemic approaches are implicitly inclusive. Transformation of societies requires that all citizens are enabled to act according to their roles and related responsibilities. A prerequisite for this to happen is that stakeholders must be categorically identified, mapped, and contacted in a manner that informs them of the purposes and intentions, opportunities and expectations (legally mandated or otherwise) involved with moving toward a sustainable food system.

Public private partnerships

Progression toward sustainable food systems depends on acting toward clear and common goals among all stakeholders. Supply and demand are strong determinants of what happens in production and consumption, and concomitantly with economic successes and failures. Market forces alone however are not sufficient to support societal transformation toward sustainability. However, in a purely market-based sense, governmental entities are often huge customers through public procurement and can lead by example with respect to influencing activities across the value chain. Beyond the value chain itself, the public and private sectors can collaborate in terms of research and development, infrastructure, and other public services.

Education, awareness raising, and capacity building

Establishing a common understanding of goals and sharing knowledge about the practices that lead to them are crucial to improving practices, whether it is in production techniques, consumer choices, or any other facet. Research and experimentation, extension services, school programs, public campaigns, training of government agents and other service providers, and forums for exchange among different stakeholder groups to enable understanding of interdependence, commonality of purpose, and individual roles is vital for mutually supportive, sustained efforts.
**Strengthening the policy environment, financial incentives**

The role that the public sector can play in terms of public-private partnerships can be directly defined and supported by public policy. Policies that protect and steward common goods and resources (such as soil, water, air, mineral resources, biodiversity, energy resources), and increase investment in human development (i.e. health, education, and growth opportunities) are inherent in a move toward sustainable food systems. Inequality among stakeholders has to be compensated at least to some degree by public sector (i.e. government) intervention, in a way that leads to greater overall prosperity. The “rules of the game” need to be adjusted so that the true costs and benefits of certain practices are accounted for in a fair manner. Financial incentives are not the only consideration but are one of the strongest levers of change available.

**Research and innovation**

While solutions already exist and are available for solving most of society’s challenges, these solutions can be further enhanced, and new ones devised. Furthermore, the dissemination, spread, and uptake of certain solutions needs to be amplified in order for them to have more impact; such amplification may also need another innovation to make that happen, whether said innovation is technical, technological, social, or political. Ongoing investment in and encouragement of innovations and the appropriate precautions involved with overseeing them is one of the animating forces of continual improvement and progress. Innovation can originate from any stakeholder.

**Metric based monitoring and evaluation**

Ability to track progress is a fundamental tool for assessing performance and making improvements over time. Different levels of operations, activities, or oversight needs may require different data collection and focus, but all the levels should have a reasonable degree of resonance and ability to converge, from the most detailed sets of data collected for individual enterprises or actors up to more macro- or aggregated data sets to measure progress on a societal basis. Monitoring and evaluation using such data sets depends on identifying the desired outcomes at any given level. Furthermore, metrics for calculating absolute performance and improvement over time with respect to use of natural or human capital (and corresponding monetization of such – see true cost accounting in chapter 4 below) can serve as concrete levers for changing practices.
Box 4: How the SFS Programme implements the above strategies in the context of its Sustainable Food Systems Approach

Multi-stakeholder engagement: The SFS Programme has five stakeholder clusters and is being co-led in a multi-stakeholder way by Hivos, WWF, Switzerland and South Africa. The co-leads are supported by a Multi-stakeholder Advisory Committee (MAC) with 23 members, taking their decisions by consensus. MAC members are elected by the membership for two years, while the co-leads are elected by the MAC for a mandate of four years. Several members have joined forces in so-called “core initiatives”, which are in themselves multi-stakeholder partnerships acting at different levels (global, regional, national). As a contribution towards its objective in relation to ‘promoting enabling environments that are conducive to sustainable food systems’, the SFS Programme stimulates the creation of roundtables to strengthen multi-stakeholder engagement at national and local level.

Public private partnerships: The private sector is actively engaged in the SFS Programme’s work, both in policy-related discussions as well as through the implementation of the Programme’s project portfolio. For example, Nestlé is leading the core initiative “Complementing existing value chain sustainability assessments: Measuring, communicating, and valuing biodiversity in food systems”, with the active involvement of UN Environment and the civil society organization Global Nature Fund.

Education, awareness raising and capacity building: Raising awareness and building capacity on the need to shift to more sustainable food systems are among the SFS Programme’s four main objectives, and education is an important component of both of them. In the context of the core initiative on food losses and waste, for instance, FAO and UN Environment are running social media campaigns on the need to reduce food losses and waste. On a different level, the social enterprise Foodways Consulting has developed a smartphone app to help Millennials make more sustainable food choices.

Strengthening the policy environment, financial incentives: Contributing towards the SFS Programme’s objective of promoting enabling environments that are conducive to sustainable food systems, the Transformative SFS Framework mentioned above provides guidance on how to implement a food systems approach to decision making. It proposes key policy-

---

135 The five clusters are: government agencies; UN agencies and other intergovernmental organizations; civil society organizations; scientific and technical organizations; and the private sector.
136 See box 2 for a more detailed description of the SFS Programme’s multi-stakeholder approach.
138 For more information see: http://www.oneplanetnetwork.org/initiative/my-food-skills-affiliated
levers, methodologies, tools and collaborative activities to explore how the transition to sustainable food systems could be accelerated.\textsuperscript{139}

**Research and innovation:** The SFS Programme has a strong research basis and all the work undertaken is thoroughly underpinned by science. Many leading research and technical institutions in the area of food and agriculture are part of the Programme. For example, the University of Michigan and CIAT, through their affiliated project “Entry Points to Advance Transitions towards Sustainable Diets” (EATS), work on generating unique information packages aimed at informing evidence-based, systems-level decision making on sustainable diets, by identifying critical decision making needs, data gaps, and insights into the policy process at diverse scales.\textsuperscript{140}

**Metric based monitoring and evaluation:** The SFS Programme and its members report annually on their progress and activities, through the rigorous monitoring and evaluation framework of the One Planet Network. The Secretariat of the One Planet Network compiles and consolidates the submitted information, and produces a narrative report to the attention of the High-level Political Forum on Sustainable Development (HLPF) and the UN Economic and Social Council (ECOSOC).\textsuperscript{141}

\textsuperscript{139} For more information on the SFS transformative framework see section 2.1.

\textsuperscript{140} More information on this project will soon become available here: http://www.oneplanetnetwork.org/sustainable-food-system/affiliated-projects-sfs-programme

\textsuperscript{141} See http://www.oneplanetnetwork.org/reporting-tool-sample and https://www.youtube.com/watch?v=tIwcyMdMjia0
4. Further definitions of relevance to Sustainable Food Systems

This chapter contains a list of definitions of further terms and concepts in relation to Sustainable Food Systems.

Whenever possible, this glossary makes use of broadly and ideally internationally agreed definitions, including definitions coined by relevant inter-governmental organizations and/or other authoritative scientific and/or multi-stakeholder bodies or processes. In some cases where terms did not have a commonly agreed definition but it was felt that they are of great relevance to the sustainable food systems debate, a selection of the most leading definitions has been included.

**Agriculture**
FAO defines “agriculture” as also encompassing horticulture, livestock, fishing and forestry activities, along with forage and milk production.

---

**Climate-smart agriculture**
Climate-Smart Agriculture is an approach to help the people who manage agricultural systems respond effectively to climate change. The CSA approach pursues the triple objectives of sustainably increasing productivity and incomes, adapting to climate change and reducing greenhouse gas emissions where possible. This does not imply that every practice applied in every location should produce “triple wins”. Rather the CSA approach seeks to reduce trade-offs and promote synergies by taking these objectives into consideration to inform decisions from the local to the global scales and over short and long time horizons, to derive locally-acceptable solutions.

---

**Community supported agriculture**
“Community supported agriculture is a partnership between a farm and consumers where the risks and rewards of farming are shared. No two forms of community supported agriculture are alike, but all of them are generally organized according to 4 principles:

- Partnership: community supported agriculture is based on a partnership, usually formalized as an individual contract between each consumer and the producer, and characterized by a mutual commitment to supply one another (with money and food) over an extended period of time, beyond any single act of exchange. The contracts, oral or written, last for several months, a season or a year.
- Local: community supported agriculture are part of an active approach to relocalizing the economy. But local in the community supported agriculture movement is not restricted to a geographical meaning. The idea is that local producers should be well integrated into their surrounding areas: their work should benefit the communities which support them.
- Solidarity: community supported agriculture are based on solidarity between producers and support groups and involve:
  - Sharing both the risks and the benefits of a healthy production that is adapted to the natural rhythm of the seasons and is respectful of the environment, natural and cultural heritage and health.
  - Paying a sufficient fair price up-front to enable farmers and their families to maintain their farms and live in a dignified manner.
- The producer/consumer tandem: is based on direct person-to-person contact and trust, with no intermediaries or hierarchy.

**Conservation agriculture**

Conservation agriculture is a farming system that promotes maintenance of a permanent soil cover, minimum soil disturbance (i.e. no tillage), and diversification of plant species. It enhances biodiversity and natural biological processes above and below the ground surface, which contribute to increased water and nutrient use efficiency and to improved and sustained crop production. Conservation agriculture principles are universally applicable to all agricultural landscapes and land uses with locally adapted practices. Soil interventions such as mechanical soil disturbance are reduced to an absolute minimum or avoided, and external inputs such as agrochemicals and plant nutrients of mineral or organic origin are applied optimally and in ways and quantities that do not interfere with, or disrupt, the biological processes. Conservation agriculture facilitates good agronomy, such as timely operations, and improves overall land husbandry for rainfed and irrigated production. Complemented by other known good practices, including the use of quality seeds, and integrated pest, nutrient, weed and water management, etc., CA is a base for sustainable agricultural production intensification. It opens increased options for integration of production sectors, such as crop-livestock integration and the integration of trees and pastures into agricultural landscapes.

**Family farming**

Family farming includes all family-based agricultural activities, and it is linked to several areas of rural development. Family farming is a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labour, including both women’s and men’s.

Both in developing and developed countries, family farming is the predominant form of agriculture in the food production sector. At national level, there are a number of factors that are key for a successful development of family farming, such as: agro-ecological conditions and territorial characteristics; policy environment; access to markets; access to land and natural resources; access to technology and extension services; access to finance;
demographic, economic and socio-cultural conditions; availability of specialized education among others..vi

**Integrated production**

Integrated production is a form of agriculture aiming at minimizing the use of inputs from outside the farm by implementing a variety of production enterprises, long and diversified crop rotations, crop residue or animal excreta restitution to the soil. Their implementation promotes the recycling soil nutrients and overall soil quality, and reduces the issues linked to pests and diseases. In line with the principles of agroecology, integrated production relies on a global or systemic approach of farm management whose aim is to better organize the interactions between production enterprises in time and/or in space (e.g. supply of grain legumes from the cropping system to the livestock system, and provision of manure from the livestock system to the cropping system).vii

**Organic agriculture**

Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system.viii

**Permaculture**

The definition of permaculture varies among sources and displays an expansion in subject area over time. In 1978, permaculture was defined in the founding text as “an integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man ... in essence, a complete agricultural ecosystem, modeled on existing but simpler examples” (Mollison and Holmgren 1978, p. 1). By 1988, the definition had grown in scope to encompass broader issues of human settlement while maintaining a core agricultural focus: “Permaculture ... is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way” (Mollison). While permaculture addresses multiple aspects of human settlement, this paper will focus primarily on those aspects of permaculture relevant to agriculture and agroecological transition.ix
**Precision agriculture**

Precision agriculture is a management system that is information and technology based, is site specific and uses one or more of the following sources of data: soils, crops, nutrients, pests, moisture or yield, for optimum profitability, sustainability and protection of the environment. It encompasses the use of computers, satellite positioning systems and remote sensing devices to provide information on which enhanced decisions can be made.\(^x\)

**Ponics, hydroponics, aquaponics**

Aquaponics refers to any system that combines conventional aquaculture (raising aquatic animals such as snails, fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment. In normal aquaculture, excretions from the animals being raised can accumulate in the water, increasing toxicity. In an aquaponic system, water from an aquaculture system is fed to a hydroponic system where the by-products are broken down by nitrifying bacteria initially into nitrites and subsequently into nitrates that are utilized by the plants as nutrients. The water is then recirculated back to the aquaculture system. As existing hydroponic and aquaculture farming techniques form the basis for all aquaponic systems, the size, complexity, and types of foods grown in an aquaponic system can vary as much as any system found in either distinct farming discipline.\(^xi\)

**Regenerative agriculture**

Regenerative Agriculture is a system of farming principles and practices that increases biodiversity, enriches soils, improves watersheds, and enhances ecosystem services.

Regenerative Agriculture aims to capture carbon in soil and aboveground biomass, reversing current global trends of atmospheric accumulation. At the same time, it offers increased yields, resilience to climate instability, and higher health and vitality for farming and ranching communities. The system draws from decades of scientific and applied research by the global communities of organic farming, agroecology, Holistic Management, and agroforestry.\(^xii\)

**Social farming (care farming)**

Social farming, or care farming as it is also called, defines short or long-term activities that use agricultural resources such as animals and plants to promote and generate social services in rural areas. Examples of these services include rehabilitation, therapy, sheltered employment, life-long education and other activities that contribute to social inclusion.\(^xiii\)
**Urban agriculture / urban gardening**

Urban and peri-urban agriculture (UPA) can be defined as the growing of plants and the raising of animals within and around cities.

Urban and peri-urban agriculture provides food products from different types of crops (grains, root crops, vegetables, mushrooms, fruits), animals (poultry, rabbits, goats, sheep, cattle, pigs, guinea pigs, fish, etc.) as well as non-food products (e.g. aromatic and medicinal herbs, ornamental plants, tree products).

UPA includes trees managed for producing fruit and fuelwood, as well as tree systems integrated and managed with crops (agroforestry) and small-scale aquaculture.

---

**Agroecology**

Please refer to 3.1.2. for the definition of Agroecology.

**Animal welfare**

Terrestrial Animal Health Code of World Organisation for Animal Health defines animal welfare as "how an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear, and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment."

---

**Biodiversity**

'Biological diversity' means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.

**Agro-biodiversity**

Agricultural biodiversity is a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agricultural ecosystems, also named agro-ecosystems: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes.

Agricultural biodiversity is the outcome of the interactions among genetic resources, the environment and the management systems and practices used by farmers. This is the result of both natural selection and human inventive developed over millennia.

The following dimensions of agricultural biodiversity can be identified:
1) **Genetic resources for food and agriculture:**
   - Plant genetic resources, including crops, wild plants harvested and managed for food, trees on farms, pasture and rangeland species,
   - Animal genetic resources, including domesticated animals, wild animals hunted for food, wild and farmed fish and other aquatic organisms,
   - Microbial and fungal genetic resources.

   These constitute the main units of production in agriculture, and include cultivated and domesticated species, managed wild plants and animals, as well as wild relatives of cultivated and domesticated species.

2) **Components of biodiversity that support ecosystem services** upon which agriculture is based. These include a diverse range of organisms that contribute, at various scales to, *inter alia*, nutrient cycling, pest and disease regulation, pollination, pollution and sediment regulation, maintenance of the hydrological cycle, erosion control, and climate regulation and carbon sequestration.

3) **Abiotic factors**, such as local climatic and chemical factors and the physical structure and functioning of ecosystems, which have a determining effect on agricultural biodiversity.

4) **Socio-economic and cultural dimensions.** Agricultural biodiversity is largely shaped and maintained by human activities and management practices, and a large number of people depend on agricultural biodiversity for sustainable livelihoods. These dimensions include traditional and local knowledge of agricultural biodiversity, cultural factors and participatory processes, as well as tourism associated with agricultural landscapes.\(^{xvii}\)

---

**Biological Pest Control**

Method of controlling pests, diseases and weeds in agriculture that relies on natural predation, parasitism or other natural mechanisms that restrain the development of pathogenic organisms.\(^{xviii}\)

**Biotechnology**

Biotechnology includes a broad range of technologies applied in crops, livestock, forestry, fisheries and aquaculture, and agro-industry.

They are used for many different purposes, such as the genetic improvement of plants and animals to increase their yields or efficiency; characterization and conservation of genetic resources for food and agriculture; plant and animal disease diagnosis; vaccine development; and production of fermented foods.\(^{xix}\)

**Blockchain**

A blockchain is a digital record of transactions. The name comes from its structure, in which individual records, called blocks, are linked together in single list, called a chain. Blockchains
are used for recording transactions made with cryptocurrencies, such as Bitcoin, and have many other applications.

Blockchain technology has vast applications across many food industry areas, especially traceability, logistics, and finance.

**Circular economy**

The aspiration of a circular economy is to shift material flows toward a zero waste and pollution production system.

**City-Region Food System**

"The food system of any city is a hybrid — it combines different means of food provisioning and consumption. Some cities mainly rely on urban, peri-urban and nearby rural farms and food processors, while others depend mostly on food produced and processed in other countries or continents. Food systems link rural and urban communities within a country, across regions and sometimes between continents. Consequently, cities and urban food supply systems play an important role in shaping their surrounding and more distant rural areas. Land use, food production, environmental management, transport and distribution, marketing, consumption and water management are of concern in both urban and rural areas.

For “City-Region Food Systems Approach”, please refer to box 3 in 3.1.3.

**Collaborative consumption**

Collaborative consumption encompasses the sharing economy. Collaborative consumption can be defined as the set of resource circulation systems, which enable consumers to both "obtain" and "provide", temporarily or permanently, valuable resources or services through direct interaction with other consumers or through a mediator. Collaborative consumption is not new; it has always existed (e.g. in the form of flea markets, swap meets, garage sales, car boot sales, and second-hand shops).

**Consumer awareness / education**

Please help us by providing a definition (together with its source).

**Consumer behavior**

Consumer behaviour reflects the choices made by consumers, at household or individual levels, on what food to acquire, store, prepare and eat, and on the allocation of food within the household (including gender repartition, feeding of children). Consumer behaviour is influenced by personal preferences determined by taste, convenience, culture and other factors. However, consumer behaviour is also shaped by the existing food environment. Collective changes in consumer behaviour can open pathways to more sustainable food systems that enhance food security and nutrition (FSN) and health.

**Consumer information / (food) product information**

Consumer information comprises information on the qualities and characteristics of products and services on the market. The most common instruments for consumer information include:

- labelling;
- instructions for use;
- assembly instructions;
- precautions regarding employment or use;
- any warning intended for the final user of the product or service. xxv

**Product Sustainability Information**

A range of tools and systems that seek to guide consumers to make more sustainable choices about goods and services (products), including in their use and end of life phase. These include ecolabels, voluntary standards, product declarations, ratings, marketing claims, footprinting, life-cycle assessments and other ways of communicating with consumers on environmental, (socio) economic and social issues. They can be single- or multi-issue, and may follow a life cycle approach to provide a holistic perspective considering the impacts of every stage of the product life, including how a product is used and how it is treated responsibly at end-of-life. xxvi

**Fast-moving consumer goods**

Fast-moving Consumer Goods (FMCG) or Consumer Packaged Goods (CPG) are products that are sold quickly and at relatively low cost. Examples include non-durable goods such as packaged foods, beverages, toiletries, over-the-counter drugs and other consumables. xxvii

Fast-moving consumer goods are products that sell quickly at relatively low cost – items such as milk, gum, fruit and vegetables, toilet paper, soda, beer and over-the-counter drugs. xxviii

**Cradle to cradle**

Cradle to cradle promotes the principle that products can be designed from the outset so that, after their useful lives, they will provide nourishment for something new. This could be either as a biological nutrient that will easily re-enter the water or soil without depositing synthetic materials and toxins or as technical nutrients that will continually circulate as pure and valuable material within a closed loop industrial cycle. xxix

**Determinants of health**

Please help us by providing a definition (together with its source).

**Ecosystem Approach**

Please refer to 3.1.2. for the definition of the Ecosystem Approach.

**Ecosystem services / environmental services (incl. incentives for ecosystem services)**

Ecosystem services are defined as the benefits people obtain from ecosystems. In the Millennium Ecosystem Assessment, ecosystem services can be divided into supporting, regulating, provisioning and cultural. IPBES recognizes that many services fit into more than one of the four categories. For example, food is both a provisioning service and also, emphatically, a cultural service, in many cultures. In agroecosystems, ecosystem services have the particularity of being co-produced by nature and humans. xxx
**Incentives for Ecosystem Services**

**Incentives for Ecosystem Services** (IES) are packages of measures that encourage farmers to protect and deliver more ecosystem services through better management of crops, livestock, forests and fisheries, and conservation of endangered species and protected habitats.

An IES package can create an umbrella of programmes to support farmers' transition to more sustainable agricultural production and to overcome technical, cultural or financial adoption barriers to sustainable production. Incentives for ecosystem services are diverse, ranging from regulatory (permits, laws, quotes) to voluntary (certification, labelling). Public policies to improve farm productivity can be combined with those that reward conservation practices. Both can see its results maximized by partnering with green business strategies such as ecological value-added markets, and civil society initiatives that support improved livelihoods and social protection.

**Payments for Ecosystem Services**

**Payments for ecosystem services** (PES) is a type of market-based instrument that is increasingly used to finance nature conservation. Payment of ecosystem services programmes allow for the translation of the ecosystem services that ecosystems provide for free into financial incentives for their conservation, targeted at the local actors who own or manage the natural resources.

**Enabling environments**

The enabling environment is often described as the laws, social and cultural norms, institutions, and procedures that guide behavior in agricultural markets and the food systems. A facilitating enabling environment is inclusive of the informal and formal rules, codes of conduct, and the structures and institutions that support them. It also includes the important social and cultural norms and incentives that ultimately influence behavior, relationships and decision-making across transactions in a system.

**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.

As a consequence of negative externalities, private costs of production tend to be lower than its “social” cost. It is the aim of the “polluter/user-pays” principle to prompt households and enterprises to internalize externalities in their plans and budgets.

**Extension services**

See Rural Advisory Services (RAS).

**Food environment**

The food environment refers to the physical, economic, political and socio-cultural context in which consumers engage with the food system to acquire, prepare and consume food. The food environment consists of: “food entry points”, i.e. the physical spaces where food is obtained; the built environment that allows consumers to access these spaces; personal
determinants of food choices (including income, education, values, skills, etc.); and the political, social and cultural norms that underlie these interactions. The key elements of the food environment that influence food choices, food acceptability and diets are: physical and economic access to food (proximity and affordability); food promotion, advertising and information; and food quality and safety.  

**Food losses and waste**  
Please refer to 2.2.3. for the definition of food losses and waste.

**Food security**  
Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.  

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.

**Food sovereignty**  
"Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations."

**Food standards**  
Standards for food and agricultural products specify characteristics linked to the product’s content or composition, function or performance, process or production methods, origin, and/or labelling or packaging. Voluntary standards refer to a broad group of public and private standards whose adoption by users is not mandatory. They are developed by governments, intergovernmental organizations, private companies or consortia, non-governmental organizations or multiple stakeholders.

The Codex Alimentarius, or "Food Code" is a collection of standards, guidelines and codes of practice adopted by the Codex Alimentarius Commission. The Codex Alimentarius international food standards, guidelines and codes of practice contribute to the safety, quality and fairness of this international food trade. Consumers can trust the safety and quality of the food products they buy and importers can trust that the food they ordered will be in accordance with their specifications.

**Food types / groups**  
Please help us by providing a definition (together with its source).

**Footprint approaches (ecological, water, carbon, etc.)**  
The Ecological Footprint is an index of the area of productive land and aquatic ecosystems required to produce the resources used and to assimilate the wastes produced by a defined
population at a specified material standard of living, wherever on Earth that land may be located.xli

The Ecological Footprint measures the ecological assets that a given population requires to produce the natural resources it consumes (including plant-based food and fiber products, livestock and fish products, timber and other forest products, space for urban infrastructure, goods and services) and to absorb its waste, especially carbon emissions. The Ecological Footprint measures how fast we consume resources and generate waste. It can be measured for a single process, such as growing rice, for a product, such as a pair of jeans, for the fuel we put in our car, or for an entire multi-national company. The water footprint can also tell us how much water is being consumed by a particular country – or globally – in a specific river basin or from an aquifer.xlii

**Gastronomy**

Gastronomy is the study of the relationship between food and culture, the art of preparing and serving rich or delicate and appetizing food, the cooking styles of particular regions, and the science of good eating.xliii

**Genetically Modified Organism**

Any organism, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.xliv

**Interconnected policy-making**

Please help us by providing a definition (together with its source).

**Life-cycle assessment**

The compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.xlv

**Food literacy**

Please help us by providing a definition (together with its source).

**Market-based approaches**

Please help us by providing a definition (together with its source).

**Mitigation Hierarchy**

The mitigation hierarchy is defined as:

» Avoidance: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity.

» Minimisation: measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible.
Rehabilitation/restoration: measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised.

Offset: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and/or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity.

A key principle is that offsets cannot provide a justification for proceeding with projects for which the residual impacts on biodiversity are unacceptable. This means that the avoidance options have to be considered seriously in harmful cases.\textsuperscript{xlvi}

**Multi-stakeholder roundtables**

Multi-stakeholder partnerships (MSPs) are defined as any collaborative arrangement among stakeholders from two or more different spheres of society (public sector, private sector and/or civil society), pooling their resources together, sharing risks and responsibilities in order to solve a common issue, to handle a conflict, to elaborate a shared vision, to realize a common objective, to manage a common resource and/or to ensure the protection, production or delivery of an outcome of collective and/or public interest.\textsuperscript{xlvii}

**Nature-based solutions**

Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.\textsuperscript{xlviii}

Nature-based solutions is understood as actions that ‘aim to help societies address a variety of environmental, social and economic challenges in sustainable ways. They are actions which are inspired by, supported by or copied from nature’.\textsuperscript{xlix}

**Nutrition**

Please help us by providing a definition (together with its source).

**Participatory guarantee systems**

Participatory Guarantee Systems (PGS) are locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.\textsuperscript{l}

**Processed and ultra-processed food**

Please help us by providing a definition (together with its source).

**Public health approaches**

Please refer to 3.1.4. for the definition of Public Health Approaches.

**Resilient production systems**

Please refer to 2.2.4. for the definition of Resilient Production Systems.
**Resource efficiency / efficient use of natural resources**

Resource efficiency means using the Earth’s limited resources in a sustainable manner while minimising impacts on the environment. It allows us to create more with less and to deliver greater value with less input.\(^{ii}\)

**Responsible investments in agriculture and food systems**

The CFS Principles for Responsible Investment in Agriculture and Food Systems – known as RAI – acknowledge that the starting point for defining how responsible investment in agriculture and food systems can contribute to food security and nutrition is the recognition and respect for human rights. They are a set of ten principles that apply to all types and sizes of agricultural investment including fisheries, forests and livestock. They address all stakeholders and apply to all stages of the value chain. As a soft law instrument they are globally applicable and include actions to address a range of environmental, social and economic issues.\(^{iii}\)

**Rural advisory services (RAS)**

Also called extension, RAS are all the different activities that provide the information and services needed and demanded by farmers and other actors in rural settings to assist them in developing their own technical, organizational, and management skills and practices so as to improve their livelihoods and well-being.\(^{iii}\)

GFRAS, the Global Forum for Rural Advisory Services, holds the view that RAS need to be demand-driven and pluralistic (e.g. multisectoral).

**Smallholder farmers**

While there is no unique and unambiguous definition of a smallholder, the most common approach is based on scale, measured either in absolute terms (2 hectares is standard) or relative to a country-specific threshold that takes into account agro-ecological, economic and technological factors. Definitions based on farm size ignore a number of other characteristics that are generally associated with smallholders, such as limited access to resources, reliance on family labour and less integration into markets.\(^{iv}\)

**Sustainable agricultural development**

Sustainable agricultural development is agricultural development that contributes to improving resource efficiency, strengthening resilience and securing social equity/responsibility of agriculture and food systems in order to ensure food security and nutrition for all, now and in the future.\(^{iv}\)

**Sustainable consumption and production**

The use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations.\(^{v}\)
**Sustainable diets**
Please refer to 2.2.1. for the definition of Sustainable Diets.

**Sustainable Food Systems**
Please refer to 2.1.1. for the definition of Sustainable Food Systems, and to 2.1.2. for the Sustainable Food Systems Approach.

**Sustainable intensification** Please refer to 3.1.1. for the definition of Sustainable Intensification.

**Sustainable lifestyles**
A “sustainable lifestyle” is a way of living enabled both by efficient Lifestyles infrastructures, goods and services, and by individual choices and actions that minimise the use of natural resources, and generation of emissions, wastes and pollution, while supporting equitable socio-economic development and progress for all.

Creating sustainable lifestyles means rethinking our ways of living, how we buy and how we organise our everyday life. It is also about altering how we socialise, exchange, share, educate and build identities. It is about transforming our societies and living in balance with our natural environment. As citizens, at home and at work, many of our choices on energy use, transport, food, waste, communication and solidarity contribute to building sustainable lifestyles.

Governments have a key role to play by creating the appropriate frameworks and infrastructures (regulatory instruments, technological innovations, new public services) to enable citizens to change. Information and education are essential, as well as the full participation of civil society in the movement and the involvement of the business sector that can develop innovative solutions for sustainable lifestyles.\(^{lvi}\)

**Sustainable value chains**
Please refer to 2.2.2. for the definition of Sustainable Value Chains, and to 2.2.2.1. for the Sustainable Food Value Chain Approach.

**Territorial approaches**
Please refer to 3.1.3. for the definition of Territorial Approaches.

**Tillage (no-till, conservation-tillage, conventional-tillage)**
*Conservation tillage:* Set of various techniques to prepare the soil at varying depths but without turning over the soil. Conservation tillage is a broadly defined practice that includes no-till, strip till, ridge till, shallow tillage and mulch till systems. These techniques maintain plant residues on at least 30% of the soil surface after tillage activities. Using these techniques, it is possible to limit erosion but not cancel it, and limit soil compaction. These techniques have a positive impact on soil life but require greater technical control than ploughing does in order to ensure good planting (enough fine soil) without promoting the creation of a slaking crust.\(^{lviii}\)
**True cost accounting**

True cost accounting (TCA) is a critical tool to help us, as a global community, better understand the impacts of food systems, address the most harmful practices, and find new, positive pathways forward. By evaluating the impacts – both positive and negative – inherent in different food systems, and making these impacts transparent, decision-makers on farms and in governments, institutions, and businesses can make better informed decisions that take into account the economic, environmental, and social impacts of their choices.\textsuperscript{lix}

**Impact valuation**

Impact Valuation can be defined as the application of welfare economics to determine the positive and negative value contribution of business activities to society in monetary terms.\textsuperscript{lx}

**Uncultivated food**

Please help us by providing a definition (together with its source).

**Voluntary approaches**

Please help us by providing a definition (together with its source).

**Voluntary standards (including labels and certification)**

“Voluntary Sustainability Standards (VSS) are rules that producers, traders, manufacturers, retailers or service providers may be asked to follow so that the things they make, grow or do don’t hurt people and the environment. These standards help keep workers healthy and safe, protect communities and land, and uphold human rights, as well as moderating the environmental impacts of production and consumption.”\textsuperscript{bx}

**Food labelling (incl. nutrition, health, and sustainability)**

Please help us by providing a definition (together with its source).

**Certification**

Please help us by providing a definition (together with its source).

**Sustainability information schemes**

Please help us by providing a definition (together with its source).
Annex 1: A comprehensive illustration of the global food system

Annex 2: The SDG “Wedding Cake”\textsuperscript{143}

\textsuperscript{143} Azote Images for Stockholm Resilience Centre, available at: https://www.stockholmresilience
Annex 3: A conceptual framework of food systems for diets and nutrition

http://www.fao.org/3/a-i7846e.pdf
5. Sources


iii URGENCI. “European Handbook on CSA” http://urgenci.net/cs4europe/european-handbook-on-csa/


x United States Department of Agriculture National Agricultural Library: https://agclass.nal.usda.gov/mtwdk.exe?k=glossary&l=60&w=10519&n=1&s=5&t=2

xi Rakocy, James E.; Bailey, Donald S.; Shultz, R. Charlie; Thoman, Eric S. "Update on Tilapia and Vegetable Production in the UVI Aquaponic System", University of the Virgin Islands Agricultural Experiment Station. Archived from the original on 2 March 2013: https://eals.arizona.edu/izaqua/ista/ista6/ista6web/pdf/676.pdf

xii http://www.regenerativeagriculturedefinition.com/

xiii Di Iacovo and O'Connor, 2009


xv www.oie.int/doc/ged/D5517.PDF


xvii https://www.cbd.int/agro/whatis.shtml

xviii FAO 2009a, found in http://www.academia.edu/9915424/Glossary_of_terms_on_ecosystem_services_in_agriculture


xx https://techterms.com/definition/blockchain


xxii Tecchio, P., McAlister, C., Mathieux, F., & Ardente, F. In search of standards to support circularity in product policies: A systematic approach. Journal of Cleaner Production, 168(1 December 2017), 1533-1546.


xxiv Adapted from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legissum:132036

xxv http://www.oneplanetnetwork.org/sites/default/files/guidelines_for_providing_product_sustainability_informatio
n_10yfp_cl-scp_2017.pdf, p. 51


62

https://sustainabledevelopment.un.org/content/documents/945ABC_ENGLISH.pdf


http://www.fao.org/docrep/018/mg159e/mg159e.pdf


Millennium Ecosystem Assessment 2005 "Ecosystems and human well-being: current state and trends." Millennium Ecosystem Assessment, Global Assessment Reports

Global Footprint Network: https://www.footprintnetwork.org/our-work/ecological-footprint/

Oxford Dictionary

European Union, 2001

ISO standard 14040 (2006) on LCA

Glossary European Commission and Business and Biodiversity Offsets Programme (BBOP)


http://ec.europa.eu/environment/resource_efficiency/


https://sustainabledevelopment.un.org/content/documents/945ABC_ENGLISH.pdf
https://sustainabledevelopment.un.org/content/documents/945ABC_ENGLISH.pdf


https://unfss.org/