



On food system transitions & transformations

Comprehensive mapping of the landscape of current thinking, research, and action

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WAGENINGEN
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A catalogue of recent key publications and initiatives on the topic of food system transitions and transformations from a wide range of angles. Contains hyperlinks for quick connection to web locations.

Keywords: Food systems; Transition Pathways; Literature Review

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Preface

What this is

- A selection of current/recent literature and website resources which relate to food system transitions/transformations.
- There is a lot in the list, but that is not all that there is. It is meant to be a good representation of major themes, and a starting point for further exploration in areas of specific interest.
- 95% is from 2017 and later. There are good resources from earlier dates than that as well, but often these are referred to in more recent resources.
- Focus is on what pertains to food systems transitions/transformations in particular. Relevant resources on transitions/transformations to sustainability are also included, as well as a few relevant resources related to other sectors such as health, water, energy.
- Some of the resources could be fit under more than one heading. A simple search on key terms within the document will help find the type of resources that the reader is interested in.
- Some of the links will break over time, but using the title in a new internet search will usually lead to the resource.
- This version may be updated and/or annotated later. Some references to journal articles do not yet have the stable doi reference.

What is it meant for

In general:

- Quick access to key resources to support research, consultancy, policy, and similar activities in relation to food system transitions/transformations.
- Through its comprehensiveness, support an integrated, interdisciplinary perspective on relevant dimensions and dynamics of food system transitions/transformations to be considered in policy/decision making.
- Providing an overview of what is already out there to build on, rather than starting many parallel efforts.

Specifically:

- Informing about the many possible ways of engaging with food system transitions/transformations with quick links to in-depth analyses.
- Creating awareness about potential complications, problematics, and contested approaches with quick links to in-depth analyses.
- Facilitate reflection on, e.g.,
 - trends in the plurality of ways of thinking about, researching, approaching, policy-making, decision-making in relation to food system transitions/transformations
 - key challenges identified from multiple perspectives regarding making/seeing transitions/transformations work for sustainable development and wellbeing
 - tensions among approaches
 - tendencies regarding transition pathway choices in terms of focus and decision-making
 - promising/proven options for engaging appropriately and meaningfully

What using it requires

- Do not be intimidated by the amount of references – the first time, take an hour to simply browse the document to get a feel for what the references are about.
- Actively navigate references – not only use the table of contents, but also the search function since references not always split up nicely over the different headings (there is often some overlap).
- Since this catalogue focuses on resources since 2017, use the references in the resources to find earlier relevant resources.

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1 Introduction

Integrated perspectives on food system transitions/transformations are needed (Figure 1). There is general agreement about this. However, the list of angles on related topics can be overwhelming. There is a need to find ways of acting in specific domains and themes while staying informed about an integrated perspective and not be paralysed by all that plays a role in food system transitions/transformations. On purpose, the first topic in the list is therefore “action perspectives”. In the end, all knowledge and perspectives needs to translate into appropriate ways of engaging with food system transitions/transformations.

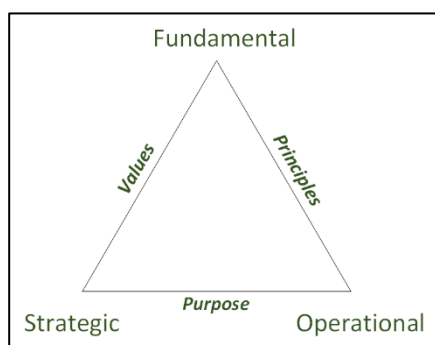


Figure 1 Three dimensions of integrated perspectives

Food is fundamental in society. This is not only about science, but also about pre-scientific persuasions and orientations. Hence the need for transdisciplinarity in relation to food system transitions and transformations. What is needed, is a balancing act between daring to make bold, principle-based decisions in specific domains (requiring a “zooming in”), and reflecting regularly, and interactively, on actions, effects, and implications from an integrated, transdisciplinary perspective (requiring a “zooming out”). A catalogue with links for further exploration can help create awareness about the problematic of reductionist perspectives. By doing so, it also shapes an interdisciplinary perspective on dimensions and dynamics of food system transitions/transformations such as articulated through the theory of modal aspects¹. The catalogue provides links to resources which cover all of the 15 modal aspects as mutually complementing angles on food system transitions/transformations.

¹ Wigboldus, S., Jochemsen, H. (2020) Towards an integral perspective on leveraging sustainability transformations using the theory of modal aspects. *Sustainability Science* (online)

Table 1 Developing systemic perspectives on food system transformations (based on Wigboldus and Jochemsen, 2020)

Aspects	Related basic questions	Food (system) connections	Leveraging food systems transformation – types of focus
Quantitative	How many?	Food amounts	Changing numbers
Spatial	Where? How big?	Food geographies, food sovereignty area	Changing location, size
Kinematic/kinetic	How fast? What direction?	Food chains	Changing speed, connection
Physical	What substance, what energy levels?	Food calories, nutrition	Changing energy/nutrition
Biotic	Is it thriving, flourishing?	Food growth, safety, security, health	Changing consumption patterns
Sensitive/psychic	How perceived?	Food preferences	Changing perceptions, attitudes
Analytical	How to make distinctions?	Food systems thinking	Changing concepts, theories
Formative	What are the ways of developing, creating?	Food production and provision	Changing ways of production, intervention
Lingual	What are the ways of symbolising, signifying?	Food cultures, food framing	Changing symbols and framing, cultures
Social	What social interaction/communion?	Food democracy	Changing social interactions
Economic	What are the ways of providing & managing?	Food economy	Changing management, changing efficiencies
Aesthetic	What is enjoyed, cherished?	Food art, food appeal	Changing recipes, food presentation
Jural	What laws, regulations and how are they applied?	Food regulations	Changing laws and regulations
Ethical	What is considered good?	Food justice, food equity, food ethics	Influencing ethical dispositions
Pistic/ fiduciary	What are the beliefs, the values?	Food as source of trust and hope	Influencing mind-sets, paradigms

We focus here on food **system** transitions/transformations. This involves two dimensions which may be represented through the metaphor of a journey: An overall transition/transformation process (the journey), and the associated pathways that are part of that journey (different roads, bridges, trails, etc. to be travelled). Some literature sources focus on the overall pathway of the journey (from a typical system A to a typical system B), and some on the contributing pathways (innovations, adaptations, etc.). Both approaches are needed.

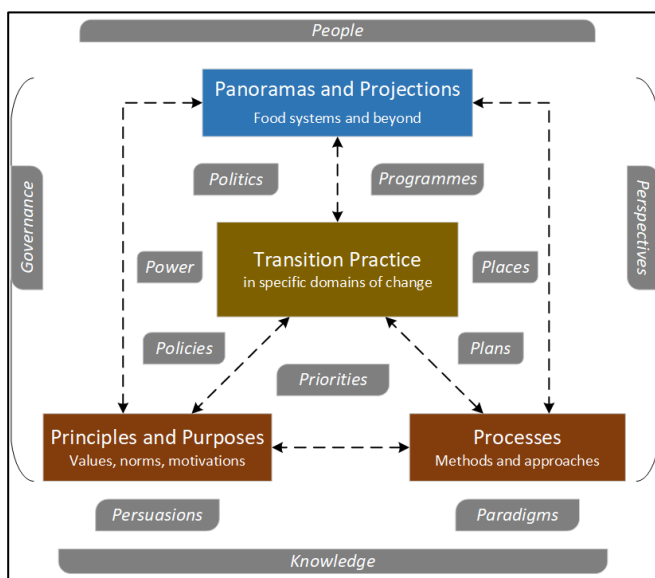


Figure 2 Different sources focus on different parts of this picture of dimensions and dynamics of food system transitions/ transformations to sustainability

A systems perspective is helpful, especially for creating an *integrated* perspective, but it also involves a risk. Food systems, in a way, do not exist. It is about the way in which we conceptualise perceived relationships between entities in our experienced reality. Without intending to do so, we easily think of systems in the same way as we think of machines which we can adjust and fix. The appropriateness of speaking of “solutions” in the context of food system transitions/transformations is therefore doubtful. Many of the references address related concerns, notably the ones relating to ethics, values, power, and politics. It matters how we conceptualise and frame food systems and how we conceptualise and frame food system transitions/transformations. The type of framing will inform perspectives, research, and approaches. This catalogue is meant to juxtapose different types of such conceptualisations and framings to articulate that food system transitions/transformations are all about a coming together of a wide variety of actor perspectives and related approaches.

Without further elaborating on it, I do want to mention Meadows’ perspective on leverage points for intervening in systems (e.g. [Abson et al. 2017](#) on leveraging sustainability transformations). She listed twelve such leverage points (later condensed to nine). The following literature sources may each be characterised along the lines of the way in which they connect to any one or a number of these leverage points.

The resources have been organised along the lines of five main areas of engaging with food system transitions/transformations:

- Perspectives: ways of sense-making and proposing action
- Research: ways of seeking evidence of patterns and projections
- Approaches and methodologies: concrete ways of/options for engaging with system transitions
- Themes and domains: key areas/subjects of focus and related transition orientations
- Global initiatives: a diversity of initiatives dedicated to contributing to (food) system/sustainability transitions

There are probably better ways to organise the catalogue, but this way of categorising will hopefully at least help in navigating the many links to resources. Still, there is a level of arbitrariness involved in listing resources under particular headings.

In browsing the various contributions, one may consider applying the lens of a food system perspective in terms of identifying the focus of the literature source in relation to such perspective. Figure 3 provides a simplified food system diagram based on [van Berkum et al. 2018](#) which may help in doing so.

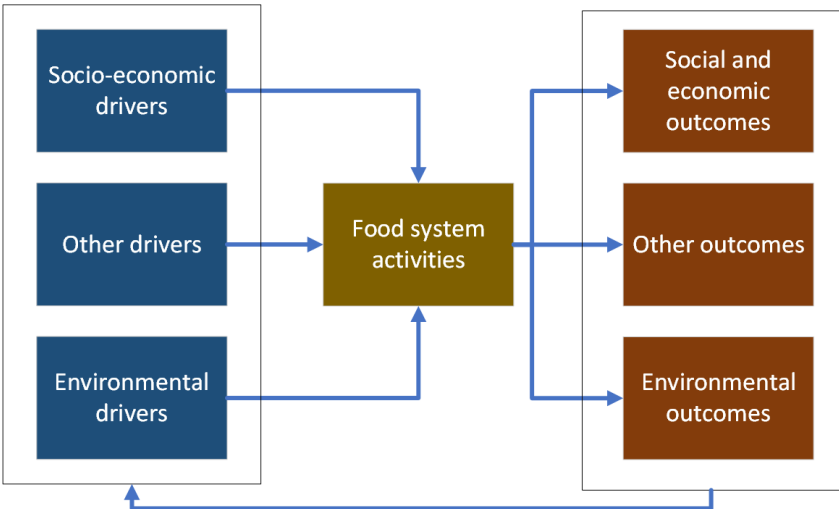


Figure 3 A simplified food system perspective (inspired by van Berkum et al. 2018)

2 Perspectives

2.1 Action perspectives

This concerns an overview of resources which provide concrete, actionable ideas and suggestions regarding transitions to sustainability in terms of focus and orientation. But this is still more at a strategic management level. The section on methodologies and approaches shows more of the operational type of things that can be done.

List of references:

- 'Fractures' in **food practices**: exploring transitions towards sustainable food
<https://doi.org/10.1007/s10460-019-09913-6>
- A food politics of the possible? Growing sustainable food systems through networks of knowledge
<https://doi.org/10.1007/s10460-015-9592-0>
- A Strategy to Support Transformation Towards Sustainability Globally: The **SDG** Transformations Forum
<https://doi.org/10.1108/S2514-175920200000004004>
- A vision for the future of the European dairy industry
<https://ieep.eu/publications/a-vision-for-the-future-of-the-european-dairy-industry>
- Advancing **Research, Policy, and Capacity** for Food System Transformation - Synthesis of Achievements from the Feed the Future Innovation Lab for Food Security Policy
<http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/133336>
- An overview of sustainable business models for innovation in Swedish agri-food production
<https://doi.org/10.1080/1943815X.2018.1554590>
- Challenges in the acceleration** of sustainability transitions
<https://doi.org/10.1088/1748-9326/ab9468>
- Critical success factors** for the transition to business models for sustainability in the food and beverage industry in the Netherlands
<https://www.sciencedirect.com/science/article/pii/S0959652617327257>
- Development **pathways** toward "zero hunger"
<https://www.sciencedirect.com/science/article/pii/S0305750X19300294>
- Driving the transition to a sustainable sector - The four phases of **market transformation**
<http://www.newforesight.com/wp-content/uploads/2018/04/NFC-Insight-s-curve-Driving-the-transition-towards-sustainability.pdf>
- Feed Africa: strategy for agricultural transformation in Africa 2016-2025
https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa_-_Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf
- Feeding ten billion people is possible within four terrestrial **planetary boundaries**
<https://doi.org/10.1038/s41893-019-0465-1>
- Fixing** our food system as a cure for our **planet**
<https://www.wbcsd.org/Overview/News-Insights/WBCSD-insights/Fixing-our-food-system-as-a-cure-for-our-planet>
- Food and agricultural innovation **pathways** for prosperity
<https://doi.org/10.1016/j.agsy.2018.01.002>
- Food systems for sustainable development: proposals for a profound **four-part transformation**
<https://link.springer.com/article/10.1007/s13593-018-0519-1>
- GM Food Systems and Their Economic Impact
<https://www.cabi.org/bookshop/book/9781789240542/>
- Impact investing in sustainable food and agriculture across asset classes - Financing Resilient Value Chains through Total Portfolio Activation
<http://www.wocan.org/sites/default/files/Investing-in-Sustainable-Food-and-Agriculture.pdf>
- IPES-Food: 10 Principles to guide the transition to Sustainable Food Systems
http://www.ipes-food.org/_img/upload/files/IPES%2010%20Principles%20of%20SFS.pdf
- Measuring what matters most - Seven systems transformations for benchmarking companies on the SDGs
<https://www.worldbenchmarkingalliance.org/wp-content/uploads/2019/10/WBA-sevensystemstransformations-report.pdf>

- New Horizons for the Transitioning of our Food System: Connecting **Ecosystems, Value Chains and Consumers** <http://www.newforesight.com/wp-content/uploads/2017/01/New-horizons-for-transitioning-our-food-system-discussion-paper.pdf>
- Opening up the **feasibility** of sustainability transitions pathways (STPs): Representations, potentials, and conditions <https://doi.org/10.1016/j.respol.2018.12.002>
- Opening up the black box of **learning-by-doing** in sustainability transitions <https://doi.org/10.1016/j.eist.2018.12.006>
- Options for Increased Private Sector Participation in Resilience Investment - Focus on Agriculture <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/969921521805628254/options-for-increased-private-sector-participation-in-resilience-investment-focus-on-agriculture>
- Options** for keeping the food system within environmental limits <https://doi.org/10.1038/s41586-018-0594-0>
- Policy recommendations on agroecological and other innovative approaches for sustainable food systems that ensure food security and nutrition <http://www.csm4cfs.org/zero-draft-cfs-policy-recommendations-agroecology-innovations/>
- Seeds of the Future in the Present: Exploring **Pathways** for Navigating Towards “Good” Anthropocenes <https://openaccess.city.ac.uk/id/eprint/19567/>
- Six paths towards sustainability: a toolkit to promote a **systemic transformation** towards sustainable development in **Finland** <http://urn.fi/URN:ISBN:978-952-326-921-7>
- The **engineering of food** with sustainable development goals: policies, curriculums, business models, and practices <https://doi.org/10.1080/19397038.2020.1722765>
- The new science of sustainable food systems - **overcoming barriers** to food system reform http://www.ipes-food.org/_img/upload/files/NewScienceofSusFood.pdf
- Towards a Sustainable Food System <https://doi.org/10.2777/282386>
- Towards sustainable food systems: a **Dutch approach** <https://library.wur.nl/WebQuery/wurpubs/fulltext/498900>
- Transdisciplinary co-production of knowledge and sustainability transformations: Three generic mechanisms of impact generation <https://doi.org/10.1016/j.envsci.2019.08.017>
- Transforming food and agriculture **to achieve the SDGs** - 20 interconnected actions to guide decision-makers; <http://www.fao.org/3/I9900EN/i9900en.pdf>
- Transition Pathways** towards Sustainability in Agriculture: Case Studies from **Europe** <https://www.cabi.org/bookshop/book/9781780642192/>
- Transition towards sustainability in agriculture and food systems: Role of **information and communication technologies** <https://doi.org/10.1016/j.inpa.2018.06.006>
- Translating the Sustainable Development Goals into action: A **participatory backcasting approach** for developing national agricultural transformation pathways <https://doi.org/10.1016/j.gfs.2016.08.002>

2.2 Ethics, values, and viewpoints

These resources represent a variety of critical perspectives on the topic area. So we could have phrased the heading also as “critical perspectives”. This is not only in relation to desired outcomes, but also in relation to the processes of transition/transformation as such. Some of these resources are about societal concerns voiced by civil society. And some of the writing may be rather polemic in nature.

List of references:

- A Handbook of **Food Crime** - Immoral and Illegal Practices in the Food Industry and What to Do About Them <https://policy.bristoluniversitypress.co.uk/a-handbook-of-food-crime>
- A people’s food policy – transforming our food system. https://www.globaljustice.org.uk/sites/default/files/files/news_article/a_peoples_food_policy_june_2017.pdf
- Agricultural **GMOs**—What We Know and Where Scientists Disagree <https://doi.org/10.3390/su10051514>

Can We Feed the World Without Destroying It? <https://foodfirst.org/product/can-we-feed-the-world-without-destroying-it/>

Changing the **Food Game** <http://www.changingthefoodgame.com/>

Enabling Sustainable Agro-Food Futures: Exploring Fault Lines and Synergies Between the Integrated Territorial Paradigm, Rural Eco-Economy and Circular Economy <https://doi.org/10.1007/s10806-016-9632-9>

Food as Commons or Commodity? Exploring the Links between **Normative Valuations and Agency** in Food Transition <https://www.mdpi.com/2071-1050/9/3/442>

Food Movements Unite! Strategies to Transform Our Food Systems <https://foodfirst.org/product/food-movements-unite-strategies-to-transform-our-food-systems/>

Food Systems Sustainability: An Examination of Different **Viewpoints** on Food System Change <https://doi.org/10.3390/su11123337>

Gene Revolution in Agriculture: 20 Years of Controversy <https://doi.org/10.5772/65876>

Grounding IPBES experts' views on the multiple values of nature in epistemology, knowledge and collaborative science <https://doi.org/10.1016/j.envsci.2019.12.003>

Hegemony, Counter-Hegemony and Food Systems Literacy: Transforming the Global Industrial Food System <https://doi.org/10.1017/aee.2019.9>

How Did We Do That? Histories and Political Economies of Rapid and Just Transitions <https://doi.org/10.1080/13563467.2020.1810216>

Innovation Systems for Transformations towards Sustainability? Taking the **Normative Dimension** Seriously <https://www.mdpi.com/2071-1050/9/12/2253>

Not Walking the Walk: How Dual Attitudes Influence Behavioral Outcomes in **Ethical Consumption Performance versus Values** in Sustainability Transformation of Food Systems <https://doi.org/10.3390/su9030332>

Principles for responsible investment in agriculture and food systems <http://www.fao.org/3/a-au866e.pdf>

SAM Scientific Opinion "Towards a sustainable food system". Moving from food as a commodity to **food as more of a common good**: independent expert report https://ec.europa.eu/info/sites/info/files/research_and_innovation/groups/sam/scientific_opinion_-_sustainable_food_system_march_2020.pdf

Systemic **ethics** and inclusive governance: two key prerequisites for sustainability transitions of agri-food systems <https://doi.org/10.1007/s10460-019-09917-2>

The paradox of productivity: agricultural productivity promotes food system inefficiency <https://doi.org/10.1017/sus.2019.3>

The **Importance of Vision** in Food System Transformation <https://www.foodsystemsjournal.org/index.php/fsj/article/view/742>

The ripple effect: Institutionalising pro-environmental values to shift societal norms and behaviours <https://doi.org/10.1016/j.ecoser.2016.08.001>

Thinking food like an East European: A critical reflection on the **framing of food systems** <https://doi.org/10.1016/j.jrurstud.2020.04.015>

Unsustainable by Design: Extractive Narratives of Ending Hunger and Regenerative Alternatives <https://repository.middlebury.edu/islandora/object/oas%3A74>

2.3 General, theoretical, and integrated perspectives

There are many resources which represent general ideas on what food system transitions to sustainability are meant to be about, and what would be appropriate ways to engage with these. This may include action perspective to some extent, but they focus on sketching more of a vision for pathways to follow.

List of references:

A transition towards sustainable food systems in **Europe Food policy** blueprint **scoping study** https://www.ifoam-eu.org/sites/default/files/food_policy_report_clean19-5-18.pdf

Characterizing **diversity of food systems** in view of sustainability transitions. A review <https://link.springer.com/article/10.1007/s13593-018-0550-2>

China's changing food system: top-down and bottom-up forces in food system transformations
<https://doi.org/10.1080/02255189.2019.1574005>

Crossing Sociological, Ecological, and Nutritional Perspectives on Agrifood Systems Transitions: Towards a Transdisciplinary Territorial Approach <https://doi.org/10.3390/su11051284>

Does China's 'going out' strategy prefigure a new food regime?
<https://doi.org/10.1080/03066150.2019.1693368>

Food in a green light. <https://www.eea.europa.eu/publications/food-in-a-green-light>

Food Transitions 2030 <https://www.wur.nl/en/article/Food-Transitions-2030.htm>

Green paper - a business case for the redesign of the food system from the ground up one field, one farmer and one family at a time <https://trriage.ag/wp-content/uploads/2019/07/Green-Paper-Redesign-of-the-Food-System-from-the-Ground-Up.pdf>

Handbook on Sustainability Transition and Sustainable Peace <https://doi.org/10.1007/978-3-319-43884-9>

Indicator framework and future visions guiding **transition pathways** for a sustainable **Brazilian** agri-food system <http://etheses.whiterose.ac.uk/24286/>

Linking **Food Democracy** and Sustainability on the Ground: Learnings from the Study of Three Alternative Food Networks in Brussels <https://doi.org/10.17645/pag.v7i4.2023>

Many pathways toward sustainability: not conflict but co-learning between transition narratives <https://link.springer.com/article/10.1007/s11625-016-0414-0>

Mapping the winds of **whole system reconfiguration**: Analysing low-carbon transformations across production, distribution and consumption in the UK electricity system (1990–2016)
<https://doi.org/10.1016/j.respol.2018.12.007>

Multiplicity of Perspectives on Sustainable Food: Moving Beyond Discursive Path Dependency in Food Policy <https://doi.org/10.3390/su11102773>

Perspectives on transitions to sustainability EEA
<https://www.eea.europa.eu/publications/perspectives-on-transitions-to-sustainability>

Planet-proofing the global food system <https://www.nature.com/articles/s43016-019-0010-4?draft=marketing>

Quantum theory for sustainability transformations <https://doi.org/10.32907/RO-113-3437>

Re-building food systems: embedding assemblages, infrastructures and reflexive governance for food systems transformations in Europe <https://doi.org/10.1007/s12571-018-0870-8>

Six Transformations to achieve the Sustainable Development Goals
<https://www.nature.com/articles/s41893-019-0352-9>

Sustainability transformations as shifts in worldviews: a dynamic view of complementarity issues
<https://doi.org/10.5751/ES-10101-230222>

The food systems approach in practice: Our guide for sustainable transformation
<https://ecdpm.org/publications/food-systems-approach-in-practice-guide-sustainable-transformation/>

The potential of **agri-food networks** in food system transformations
<https://biblio.ugent.be/publication/8606306>

Tourism and sustainable transformation: a discussion and application to tourism food consumption
<https://doi.org/10.1080/02508281.2019.1694757>

Transdisciplinary Perspectives on Transitions to Sustainability
<https://doi.org/10.4324/9781315550206>

Transforming food systems to deliver healthy, sustainable diets—the view from the world's science academies [https://doi.org/10.1016/S2542-5196\(19\)30038-5](https://doi.org/10.1016/S2542-5196(19)30038-5)

Transformation of agriculture and food systems: Application of TEEBAgriFood Framework
<https://www.thesolutionsjournal.com/article/transformation-agriculture-food-systems-application-teebagrifood-framework/>

Transforming **systems of consumption and production** for achieving the sustainable development goals: moving beyond efficiency <https://doi.org/10.1007/s11625-018-0582-1>

Transforming the Global Food System. A report by the **World Business Council** for Sustainable Development
https://docs.wbcsd.org/2019/10/WBCSD_CEO_Guide_to_Food_System_Transformation.pdf

Transition versus transformation - what is the difference
<https://www.sciencedirect.com/science/article/pii/S2210422417300801>

Transitioning towards sustainable food systems in **Europe**

https://www.foeeurope.org/sites/default/files/agriculture/2018/transitioning_towards_sustainable_food_systems.pdf

Transitioning without confrontation? Shared **food growing niches** and sustainable food transitions in Singapore <https://doi.org/10.1016/j.geoforum.2018.07.016>

Understanding Sustainable Food System Transitions: Practice, Assessment and Governance <https://onlinelibrary.wiley.com/doi/abs/10.1111/soru.12177>

2.4 Nexus perspectives

Moving to a food systems perspectives is already a step up from e.g. a focus on food security. However, a food system is part of wider societal system. Other systems affect and are affected by food systems. Notably energy, health, and water.

List of references:

'Aha' moments in the water-energy-food nexus: A new morphological **scenario** method to accelerate sustainable transformation

<https://www.sciencedirect.com/science/article/pii/S0040162519303427>

A Conceptualization of the **Urban** Food-Energy-Water Nexus Sustainability Paradigm: Modeling From Theory to Practice <https://doi.org/10.3389/fenvs.2018.00133>

Adapt now: a global call for leadership on climate resilience https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf

A workshop on transitioning **cities** at the food-energy-water nexus <https://doi.org/10.1007/s13412-016-0381-x>

After COP21: **Contested** Transformations in the Energy/Agri-Food Nexus <https://doi.org/10.3390/su11061695>

Food-energy-water (FEW) nexus for **urban** sustainability: A comprehensive review

Food-Energy-Water Nexus Resilience and Sustainable Development - Decision-Making Methods, Planning, and Trade-Off Analysis https://doi.org/10.1007/978-3-030-40052-1_1

Integrated **scenarios** to support analysis of the food-energy-water nexus <https://doi.org/10.1038/s41893-019-0418-8>

Managing the Energy-food-water-Nexus in Developing Countries: Case Studies of Transition Governance https://quantumglobalgroup.com/wp-content/uploads/2017/08/QGRL-Working-Paper-2016-1-Wakeford-et-al_LM_5-2.pdf

Multi-level system **modelling** of the resource-food-bioenergy nexus in the global south <https://doi.org/10.1016/j.energy.2020.117196>

Projecting Pathways to Food-Energy-Water Systems Sustainability Through Ontology <https://doi.org/10.1089/ees.2018.0551>

Review of transdisciplinary approaches to food-water-energy nexus: A guide towards sustainable development <https://doi.org/10.1016/j.envsci.2019.09.003>

Sustainable development and the water-energy-food nexus: A perspective on livelihoods <https://doi.org/10.1016/j.envsci.2015.08.002v>

The Water-Energy-Food Nexus in the Middle East and North Africa – Scenarios for a sustainable future <https://doi.org/10.1596/29957>

The Water-Food-Energy Nexus - **Power, Politics, and Justice** <https://doi.org/10.4324/9781315209067>

Thinking through connections in food and energy transitions <https://doi.org/10.1080/04353684.2020.1739546>

Water, Energy and Food: The Problematic Aspects of the Transition from 'Silo Approach' to 'Nexus Approach' in the Arab Region https://doi.org/10.1007/978-3-319-64024-2_2

Water-Energy-Food-Environmental Nexus in Central Asia: From Transition to Transformation https://doi.org/10.1007/698_2017_180

2.5 Power, politics, political economy, contestation

This subject matter is similar to the one on ethics, values, and viewpoints in that it also concerns critical perspectives on dynamics in food systems (transitions). It relates to questions such as 'who decides?' and 'who benefits?'. It also highlights the fact that there are differences in opinion which cannot be solved by scientific evidence and which relate to more fundamental persuasions and paradigms.

List of references:

- A perspective on radical transformations to sustainability: resistances, movements and alternatives <https://doi.org/10.1007/s11625-018-0543-8>
- Alt-Burger: Transforming Populist Food Systems <http://dx.doi.org/10.13185/KK2020.03332>
- Capitalism, food, and social movements: The political economy of food system transformation <https://doi.org/10.5304/jafscd.2019.091.043>
- Contested Sustainability Discourses in the Agrifood System <https://www.taylorfrancis.com/books/e/9781315161297>
- Contested** Transformations: Sustainable Economic Development and Capacity for Adapting to Climate Change <https://www.tandfonline.com/doi/full/10.1080/24694452.2019.1625748>
- Ecology, Capitalism and the New Agricultural Economy - The Second Great Transformation <https://doi.org/10.4324/9781351210041>
- Food politics and development <https://doi.org/10.1016/j.worlddev.2020.105024>
- Food System Transformation: Integrating a **Political–Economy and Social–Ecological Approach** to Regime Shifts <https://www.mdpi.com/1660-4601/17/4/1313>
- Food: to feed or to profit? (De)commodification in the food system and Community Supported Agriculture <http://uu.diva-portal.org/smash/get/diva2:1384838/FULLTEXT01.pdf>
- Mega-Mergers on the Menu: **Corporate Concentration and the Politics of Sustainability** in the Global Food System https://doi.org/10.1162/glep_a_00454
- Politics of Food** <https://www.sternberg-press.com/product/politics-of-food/>
- Power and politics in agri-food sustainability transitions https://www.academia.edu/39235500/Power_and_politics_in_agri-food_sustainability_transitions
- Power** in Sustainability Transitions: Analysing power and (dis)empowerment in transformative change towards sustainability <https://onlinelibrary.wiley.com/doi/full/10.1002/eet.1777>
- Redefining **power relations** in agrifood systems <https://doi.org/10.1016/j.jrurstud.2019.01.002>
- Resistance to the Neoliberal Agri-Food Regime - A Critical Analysis <https://doi.org/10.4324/9781315192437>
- Systems of Food and Systems of Violence: An Intervention for the Special Issue on "Community Self Organisation, Sustainability and Resilience in Food Systems" <https://doi.org/10.3390/su12177092>
- The **Dark Side of Transformation**: Latent Risks in Contemporary Sustainability Discourse <https://onlinelibrary.wiley.com/doi/full/10.1111/anti.12405>
- The Financialization of Agri-Food Systems - **Contested Transformations** <https://doi.org/10.4324/9781315157887>
- The Political Economy Approach to Food Systems Reform <https://doi.org/10.19088/1968-2019.115>
- The **political economy** of food systems reform <https://academic.oup.com/erae/article-abstract/44/4/705/3814333?redirectedFrom=fulltext>
- The Politics of Green Transformations: An Introduction to the Special Section <https://doi.org/10.1080/13563467.2020.1810215>
- The politics of sustainability transitions <https://doi.org/10.1080/1523908X.2016.1216782>
- The power of corporations in global food sector governance <https://doi.org/10.4337/9781785362538.00036>
- Too big to feed - Exploring the impacts of **mega-mergers**, consolidation and concentration of power in the agri-food sector http://www.ipes-food.org/_img/upload/files/Concentration_FullReport.pdf
- Traditional and new Knowledge and Practices in the Food System Transition <https://doi.org/10.34190/KM.19.090>
- Transforming Food Systems: The Potential of Engaged **Political Economy** <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14603>

3 Research

3.1 Research orientations, focus, and agendas

There are many ways to do research on food system transitions/transformations and for ways to make this useful for wider society. Hence a range of contributions which discuss what research should focus on, how research should be done, and what interpretation frameworks help to translate research findings into information for policy and practice (sense-making approaches).

List of references:

- A research vision for food systems in the 2020s: Defying the status quo
<https://doi.org/10.1016/j.gfs.2020.100397>
- A **systems approach** to research and innovation for food system transformation
<https://fit4food2030.eu/wp-content/uploads/2020/04/FIT4FOOD2030-A-Systems-Approach-to-Research-and-Innovation-for-Food-System-Transformation-Policy-Brief.pdf>
- Advancing the research agenda on food systems governance and transformation
<https://doi.org/10.1016/j.cosust.2019.08.003>
- An agenda for sustainability **transitions research**: State of the art and future directions
<https://www.sciencedirect.com/science/article/pii/S2210422418303332>
- Explaining sociotechnical transitions: A critical realist perspective
<https://doi.org/10.1016/j.respol.2018.04.008>
- Framework for the Analysis and Assessment of Food Systems Transformations
https://www.wur.nl/upload_mm/b/8/0/4f8291f5-06ef-44d4-ac00-d5820ff4c529_IFAD%20framework%20-%20Food%20System%20Transformations.pdf
- How to **study transition** problems? theories, methods and models
<https://research.tue.nl/nl/publications/how-to-study-transition-problems-theories-methods-and-models>
- IFAD RDR 2021 – Framework for the Analysis and Assessment of Food Systems Transformations
https://www.wur.nl/upload_mm/b/8/0/4f8291f5-06ef-44d4-ac00-d5820ff4c529_IFAD%20framework%20-%20Food%20System%20Transformations.pdf
- Leverage points** for sustainability transformation <https://link.springer.com/article/10.1007/s13280-016-0800-y>
- Making sustainability transitions research policy-relevant: Challenges at the science-policy interface
<https://doi.org/10.1016/j.eist.2019.12.009>
- Making sustainability transitions research **policy-relevant**: Challenges at the science-policy interface
<https://www.sciencedirect.com/science/article/pii/S2210422420300113>
- Pathways of transformation in global food and agricultural systems: implications from a large **systems change theory** perspective
<https://www.sciencedirect.com/science/article/abs/pii/S1877343517302233>
- Research pathways to foster transformation: linking sustainability science and social-ecological systems research <https://doi.org/10.5751/ES-11332-250113>
- Review of the sustainability of food systems and transition using the **Internet of Food**
<https://www.nature.com/articles/s41538-018-0027-3>
- Studying transitions: Past, present, and future <https://doi.org/10.1016/j.respol.2019.04.012>
- Sustainability **Transitions Research**: Transforming Science and Practice for Societal Change
<https://www.annualreviews.org/doi/abs/10.1146/annurev-environ-102014-021340>
- Transformations to sustainability: combining **structural, systemic and enabling approaches**
<https://doi.org/10.1016/j.cosust.2019.12.004>
- Transformative Science for Sustainability Transitions https://doi.org/10.1007/978-3-319-43884-9_5
- Transition heuristic frameworks in research on agro-food sustainability transitions
<https://doi.org/10.1007/s10668-018-0290-0>
- Whose knowledge, whose values? An empirical analysis of power in transdisciplinary sustainability research <https://doi.org/10.1186/s40309-020-0161-4>

3.2 Systematic literature reviews

Systematic literature reviews are excellent resources for getting a quick overview on a subject area and a good starting point for further exploring resources in that area. Some of the resources are not an official *systematic* literature review, but still provide a wide overview on contributions in a subject area. Most of these reviews could have also been listed under another heading because of their focus.

List of references:

- A Bibliometric Analysis of **Food-Energy-Water Nexus** Literature
<https://doi.org/10.3390/su12031112>
- A Multi-Actor Literature Review on Alternative and Sustainable Food Systems for the Promotion of Cereal Biodiversity <https://doi.org/10.3390/agriculture8110173>
- Digital Entrepreneurship** and its Role in Innovation Systems: A Systematic Literature Review as a Basis for Future Research Avenues for Sustainable Transitions
<https://doi.org/10.3390/su12072764>
- Experimenting** for sustainability transitions: A systematic literature review
<https://www.sciencedirect.com/science/article/pii/S0040162516302530>
- Facilitating sustainability transition through **serious games**: A systematic literature review
<https://doi.org/10.1016/j.jclepro.2018.10.157>
- How and Why Do Social and Sustainable Initiatives Scale?** A Systematic Review of the Literature on Social Entrepreneurship and Grassroots Innovation <https://doi.org/10.1007/s11266-020-00208-7>
- Impacts of agricultural policies** on productivity and sustainability performance in agriculture: A literature review <https://doi.org/10.1787/6bc916e7-en>
- Indigenous and local knowledge** in sustainability transformations research: a literature review
<https://doi.org/10.5751/ES-11305-250103>
- Knowledge, Attitudes and Practices** of Sustainability: Systematic Review 1990–2016
<https://doi.org/10.2478/jtes-2018-0003>
- Leverage points** for sustainability transformation: a review on interventions in food and energy systems <https://doi.org/10.1016/j.ecolecon.2019.106570>
- Report reviewing the literature on **policy and governance** of sustainability transitions
https://www.pathways-project.eu/sites/default/files/PATHWAYS_D4%203_Governance%20literature%20review%2020150528%20FINAL.pdf
- Research on agro-food sustainability transitions: A systematic review of **research themes** and an analysis of research gaps <https://doi.org/10.1016/j.jclepro.2019.02.232>
- Resilience and sustainability**: Similarities and differences in environmental management applications <https://doi.org/10.1016/j.scitotenv.2017.09.086>
- Resilience as a policy narrative**: potentials and limits in the context of urban planning
<https://doi.org/10.1080/17565529.2017.1301868>
- Responsible research and innovation**: a systematic review of the literature and its applications to regional studies <https://doi.org/10.1080/09654313.2019.1625871>
- Sustainability transitions in **developing countries**: Major insights and their implications for research and policy <https://doi.org/10.1016/j.envsci.2017.08.008>
- Sustainability-oriented **Innovation**: A Systematic Review <https://doi.org/10.1111/ijmr.12068>
- The Multi-Level Perspective in Research on Sustainability Transitions in Agriculture and Food Systems: A Systematic Review <https://www.mdpi.com/2077-0472/9/4/74>
- The Water-Energy-Food Nexus: A systematic review of methods for **nexus assessment**
<https://doi.org/10.1088/1748-9326/aaa9c6>
- Towards a typology of **intermediaries** in sustainability transitions – a systematic review
<https://www.sciencedirect.com/science/article/pii/S0048733318302385>
- Transition Pathways** to Sustainable Agricultural Water Management: A Review of Integrated Modeling Approaches <https://onlinelibrary.wiley.com/doi/full/10.1111/1752-1688.12722>
- Understanding and governing **learning** in sustainability transitions: A review
<https://www.sciencedirect.com/science/article/pii/S2210422417301983>
- What are the **ingredients for food systems change** towards sustainability? - Insights from the literature <https://doi.org/10.1088/1748-9326/ab99fd>

4 Approaches and methodologies

4.1 Design, monitoring and evaluation, management, metrics, modelling

These resource are mostly about planning and managing processes of transitions to sustainability and ways of guiding related processes and understanding how things are working out in practice. Surprisingly, there is not a whole lot to be found on monitoring and evaluation (M&E) of (food) system transitions/transformations to sustainability. This is not just about assessing outcomes of such transitions/transformations, but also about the way in which the transition/transformation processes are playing out.

List of references:

- Advancing a Multi-Level **Sustainability Management Theory** <https://doi.org/10.1108/S2514-175920200000004003>
- Co-benefits and **Trade-Offs** From Agro-Food System Redesign for Circularity: A Case Study With the FAN Agent-Based Model <https://doi.org/10.3389/fsufs.2020.00041>
- Codesigning** a resilient food system <https://doi.org/10.5751/ES-08878-21044>
- Evaluating agricultural trade-offs** in the age of sustainable development <https://doi.org/10.1016/j.agsy.2016.09.010>
- Evaluating** sustainability transitions pathways: Bridging analytical approaches to address governance challenges <https://doi.org/10.1016/j.gloenvcha.2015.08.010>
- Evaluating** sustainability transitions pathways: Bridging analytical approaches to address governance challenges <https://www.sciencedirect.com/science/article/abs/pii/S0959378015300315>
- Evolution of **design for sustainability**: From product design to design for system innovations and transitions <https://doi.org/10.1016/j.destud.2016.09.002>
- Games as boundary objects: charting **trade-offs** in sustainable livestock transformation <https://doi.org/10.1080/14735903.2020.1738769>
- Global drivers of food system (un)sustainability: A multi-country **correlation** analysis <https://doi.org/10.1371/journal.pone.0231071>
- Global **drivers** of food system (un)sustainability: A multi-country correlation analysis <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0231071>
- Global map and **indicators** of food system sustainability <https://doi.org/10.1038/s41597-019-0301-5>
- Governance** of food systems across scales in times of social-ecological change: a review of **indicators** <https://doi.org/10.1007/s12571-018-0770-y>
- How to **assess sustainability transformations**: a review <https://doi.org/10.1017/sus.2020.17>
- Learning through evaluation** – A tentative evaluative scheme for sustainability transition experiments <https://doi.org/10.1016/j.jclepro.2016.09.005>
- Managing sustainability transformations: A managerial framing approach <https://doi.org/10.1016/j.jclepro.2019.03.190>
- Measuring sustainability: An **evaluation framework** for sustainability transition experiments <https://doi.org/10.1016/j.envsci.2019.10.012>
- Modelling** Sustainability Transitions: An Assessment of Approaches and Challenges <https://doi.org/10.18564/jasss.3629>
- Modelling** Transitions - Virtues, Vices, Visions of the Future <https://www.taylorfrancis.com/books/e/9780429056574>
- Monitoring and evaluation** of climate resilience for agricultural development – A review of currently available tools <https://doi.org/10.1016/j.wdp.2017.02.001>
- Multi-indicator sustainability assessment** of global food systems <https://doi.org/10.1038/s41467-018-03308-7>
- Putting all foods on the same table: Achieving sustainable food systems requires **full accounting** <https://doi.org/10.1073/pnas.1913308116>

-
- The Food Sustainability Index https://www.barillacfn.com/en/food_sustainability_index/
<https://foodsustainability.eiu.com/heat-map/>
- Toward a sustainable **metric and indicators** for the goal of sustainability in agricultural and food production <https://doi.org/10.1080/10408398.2020.1754161>
- Toward a sustainable **metric and indicators** for the goal of sustainability in agricultural and food production <https://doi.org/10.1080/10408398.2020.1754161>
- Towards **metrics** of sustainable food systems: a review of the **resilience and vulnerability** literature <https://doi.org/10.1007/s10669-016-9584-7>
- Transformation to Global Sustainability: Implications for **Evaluation and Evaluators** <https://doi.org/10.1002/ev.20362>

4.2 Drivers, tools, methods of transition & transformation

These resources are partly similar to the ones under the heading of 'action perspectives', however, these, if appropriately listed here, are more about a "how to" focus.

List of references:

- Accelerating Transformations** to Sustainable Food Systems
https://foodsystemstransformations.org/wp-content/uploads/2019/08/BeaconsOfHope_Report_082019.pdf
- Actionable **frameworks** for food systems transformation https://futureoffood.org/wp-content/uploads/2020/04/GA_FrameworksForTransformationReport_30320Web.pdf
- Agricultural and food systems in the Mekong region: **Drivers of transformation** and pathways of change
- Communities of Food Practice: Regional Networks as Strategic Tools for Food Systems Transformation
https://doi.org/10.1007/978-3-319-57000-6_11
- Creating positive synergies between **risk management and transfer** to accelerate food system climate resilience <https://doi.org/10.1007/s10584-020-02679-5>
- Drivers and barriers of sustainability transformations: A comparison of the "Energiewende" and the attempted transformation to **organic agriculture** in Germany
<https://doi.org/10.14512/gaia.28.S1.9>
- Drivers, barriers and interventions for food waste behaviour change: a food system approach
<https://library.wur.nl/WebQuery/wurpubs/fulltext/511479>
- Drivers of **food waste** and their implications for sustainable policy development
<https://doi.org/10.1016/j.resconrec.2015.11.016>
- Education for a sustainable agri-food system <https://www.has.nl/media/2blgbl0w/education-for-a-sustainable-agri-food-system-lectoraat-nieuwe-business-modellen-has-hogeschool.pdf>
- Food system transformation toolkit** https://foodsystemstransformations.org/wp-content/uploads/2019/08/BeaconsOfHope_Toolkit_082019.pdf
- Incentivizing** food systems transformation
http://www3.weforum.org/docs/WEF_Incentivizing_Food_Systems_Transformation.pdf
- Innovative niches for sustainability transitions: how social agriculture and food start-ups can transform the food system — a case-based research study from Germany
<http://lup.lub.lu.se/student-papers/record/9012678>
- Scaling the impact of sustainability initiatives: a typology of amplification processes
<https://doi.org/10.1186/s42854-020-00007-9>
- Sustainability Transformations - **Agents and Drivers** across Societies
<https://www.cambridge.org/core/books/sustainability-transformations/8D02C1F81E9D194793E7C33545DA580D#fndtn-information>
- Tools of Transformation: From Small Scale Progress to Structural Change
https://doi.org/10.1007/978-3-319-14877-9_11
- Transformative spaces in the making: key lessons from nine cases in the Global South
<https://doi.org/10.1007/s11625-019-00749-x>

4.3 Governance and policy

The variety of contributions on the topic of food system transitions/transformations may be considered pieces of one puzzle. Governance is all about guiding processes of making choices in relation to putting the variety of pieces together to form the picture of a transformation. In that sense, it plays a pivotal role in engaging with food system transitions/transformations.

List of references:

- Assessing the role of CAP for more sustainable and healthier food systems in Europe: A literature review <https://doi.org/10.1016/j.scitotenv.2018.10.377>
- Beyond consuming ethically? Food citizens, governance, and sustainability <https://doi.org/10.1016/j.jrurstud.2020.04.006>
- Blog: As policy makers call for **building capacity** for food system transformation, who is listening? <https://www.ifpri.org/blog/policy-makers-call-building-capacity-food-system-transformation-who-listening>
- Dealing with the **game-changing technologies of Agriculture 4.0**: How do we manage diversity and responsibility in food system transition pathways? <https://doi.org/10.1016/j.gfs.2019.100347>
- Exploring the **governance and politics** of transformations towards sustainability <https://doi.org/10.1016/j.eist.2016.09.001>
- Feeding Europe: Agriculture and sustainable food systems <https://ieep.eu/uploads/articles/attachments/64e06bc1-6c2e-4b94-bc93-9150725093ac/Think%202030%20Feeding%20Europe.pdf?v=63710011359>
- Food Systems Governance - Challenges for justice, equality and human rights <https://doi.org/10.4324/9781315674957>
- Global Food Policy Report – Building Inclusive Food Systems <http://gfpr.ifpri.info/>
- How can **policy processes remove barriers** to sustainable food systems in Europe? Contributing to a policy framework for agri-food transitions <https://doi.org/10.1016/j.foodpol.2020.101871>
- Improving International **Soil Governance** <https://www.ecologic.eu/17518>
- New pathways for governing food system transformations: a pluralistic practice-based futures approach using visioning, back-casting, and serious gaming <https://doi.org/10.5751/ES-11014-240402>
- Policy packaging can make food system transformation feasible <https://doi.org/10.1038/s43016-020-0047-4>
- Subsidies and Sustainable Agriculture: Mapping the **Policy Landscape** <https://www.chathamhouse.org/sites/default/files/Subsidies%20and%20Sustainable%20Ag%20-%20Mapping%20the%20Policy%20Landscape%20FINAL-compressed.pdf>
- Sustainability transitions - **policy and practice** <https://www.eea.europa.eu/publications/sustainability-transitions-policy-and-practice>
- Sustainable agri-food investments require multi-sector co-development of decision tools <https://doi.org/10.1016/j.ecolind.2019.105851>
- Sustainable, resilient food systems for healthy diets: the transformation **agenda** <https://doi.org/10.1017/S1368980019003112>
- The global food system, agro-industrialization and governance: alternative conceptions for sub-Saharan Africa <https://doi.org/10.1080/14747731.2020.1730050>
- The need for policy to address the food **system lock-in**: A case study of the Finnish context <https://www.sciencedirect.com/science/article/pii/S0959652616308587>
- The **trade-ification** of the food sustainability agenda <https://www.tandfonline.com/doi/abs/10.1080/03066150.2016.1250077>
- Transformation in **governance** towards resilient food systems <https://cgspace.cgiar.org/handle/10568/78293>
- Transformative innovation and translocal diffusion <https://doi.org/10.1016/j.eist.2020.01.009>
- Understanding Sustainable Food System Transitions: Practice, Assessment and Governance <https://onlinelibrary.wiley.com/doi/full/10.1111/soru.12177>

4.4 Technology, innovation, and the role of research

Technology and innovation features prominently in writings on (food) system transitions/transformations to sustainability. One may say that it is part of the dominant paradigm for engaging with system change. The list includes both general approaches regarding the role of technologies/innovation(s) as well as ideas on specific technologies/innovations such as artificial intelligence and GM crops.

List of references:

- A framework of disruptive sustainable innovation: an example of the Finnish food system
<https://doi.org/10.1080/09537325.2018.1550254>
- Artificial **Intelligence** in the design of transition to Sustainable Food Systems
<https://doi.org/10.1016/j.jclepro.2020.122574>
- Conceptualising the role of **social innovation** in sustainability transformations
<https://www.taylorfrancis.com/books/e/9781315201559/chapters/10.4324/9781315201559-2>
- Designing **coupled innovations** for the sustainability transition of agrifood systems
<https://www.sciencedirect.com/science/article/abs/pii/S0308521X1630378X>
- Genetically modified crops**: current status and future prospects <https://doi.org/10.1007/s00425-020-03372-8>
- Innovating within or outside dominant food systems? Different challenges for contrasting crop diversification strategies in Europe <https://doi.org/10.1371/journal.pone.0229910>
- Innovation & entrepreneurship** driving food system transformation
<https://doi.org/10.1016/j.physbeh.2020.112866>
- Innovation can accelerate the transition towards a sustainable food system
<https://doi.org/10.1038/s43016-020-0074-1>
- Innovation in Food Ecosystems. Entrepreneurship for a Sustainable Future.
<https://doi.org/10.1007/978-3-030-33502-1>
- Innovation Trajectories and Sustainability in the Food System <https://doi.org/10.3390/su11051271>
- Links among innovation, food system transformation, and technology adoption, with implications for food policy: Overview of a special issue <https://doi.org/10.1016/j.foodpol.2017.10.003>
- Rapid transformation of food systems in developing regions: Highlighting the **role of agricultural research & innovations** <https://www.sciencedirect.com/science/article/pii/S0308521X17308922>
- Recent developments in nanotechnology transforming the agricultural sector: a transition replete with opportunities <https://doi.org/10.1002/jsfa.8749>
- Relation between innovation and sustainability in the agro-food system <https://doi.org/10.14674/IJFS-1096>
- Scaling up and out as a Pathway for Food System Transitions <https://doi.org/10.3390/su8101025>
- Supporting food systems transformation: The what, why, who, where and how of mission-oriented agricultural innovation systems <https://doi.org/10.1016/j.agsy.2020.102901>
- Technology options for feeding 10 billion people <https://www.ecologic.eu/10409>
- Transforming Research and Innovation for Sustainable Food Systems—A **Coupled-Systems Perspective** <https://www.mdpi.com/2071-1050/11/24/7176/htm>

4.5 Multi-stakeholder processes, actor roles, agency, attitudes, and capacities

Transitions/transformations is all about actors and their attitudes, agency, and capacity. Both in terms of being actively involved in particular transition processes, as well as being part of a wider enabling context for transitions/transformations. There are many roles to be considered in a systems perspective. Though not the focus of the following list, it also links back to related dynamics of power and politics, as well as to differences in perspectives and priorities.

List of references:

- A New Approach to Partnerships for SDG Transformations <https://doi.org/10.3390/su11184947>
- A perspective on **radical transformations** to sustainability: resistances, movements and alternatives <https://link.springer.com/article/10.1007/s11625-018-0543-8>
- A Sustainability Lighthouse—Supporting Transition Leadership and Conversations on Desirable Futures <https://doi.org/10.3390/su10113842>
- Agency in regime destabilization through the selection environment: The Finnish food system's sustainability transition <https://doi.org/10.1016/j.respol.2018.05.006>
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4.6 Resilience (thinking) and vulnerability

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4.7 Scenarios, futures, trends, and historical patterns

The Dutch saying “*regeren is vooruitzien*”, governing means anticipating, very much applies to transition/transformation processes. Planning and programming is all about what will take place in the future. Not knowing the future is acceptable. Not having considered potential futures is not. Even more so, we need to know the history of where we (food systems) are coming from. The connection between the importance of knowing the past and considering potential futures is nicely put together in the title of the article, *Can foresight learn from hindsight?*

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5 Themes and domains

5.1 Agroecology and (bio)diversity

Agroecology is a (wide-ranging) particular approach to the direction in which agriculture and agro-food systems should develop. A lot has been written along these lines, which we cannot skip, but it needs to remain clear that it is a specific approach. It has therefore been put under a separate heading, together with the theme of (bio)diversity since that is a central theme in agroecology.

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5.2 Circularity and bioeconomy

Sustainability and circularity are meant to be two sides of the same coin: sustainability requires circularity, and circularity is meant to contribute to sustainability. Circularity has become a central theme in itself and is not always articulated specifically as part of food system transitions/transformations to sustainability. It may be considered a transition pathway of choice for many countries.

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5.3 Climate and climate change

Climate change is a central theme in everything that has to do with sustainability. So much so, that it sometimes become a focus in itself, rather something that is part of a wider transformation to sustainability. Until COVID-19, it even tended to overshadow other sustainability concerns, such as related to soils and biodiversity. COVID-19 appears to broaden perspectives again. Yet, climate change and related responses will feature prominently in almost any initiative related to sustainability.

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5.4 COVID-19

This theme will in particular require further updating as new, better-informed, resources will come out later. COVID-19 has exposed vulnerabilities of food systems, interferes with transitions to sustainability, and has alerted us to the real possibility of discontinuity/disruption in transition pathways. It triggered ideas and initiatives for responding to the effects of COVID-19, but is increasingly also informing agendas and approaches to enhance food system resilience more generally (thinking beyond COVID-19).

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Policy Brief: The Impact of COVID-19 on Food Security and Nutrition, June 2020 https://www.un.org/sites/un2.un.org/files/sg_policy_brief_on_covid_impact_on_food_security.pdf

Rapid appraisal of food system risks with Covid-19 measures: Voices from the field https://www.wur.nl/upload_mm/2/8/1/c13ea4d4-ec95-4756-849a-9692023c85df_WUR_Rapid_Appraisal_Covid19_Food_systems_April2020.pdf

Resilience of local food systems and links to food security – A review of some important concepts in the context of COVID-19 and other shocks. <https://doi.org/10.1007/s12571-020-01076-1>

Roadmap Toward A Healthier Post-COVID Food System <https://foodtank.com/news/2020/06/this-essay-collection-is-a-roadmap-toward-a-healthier-post-covid-food-system/>

Safeguarding Africa's food systems through and beyond the crisis <https://www.mckinsey.com/featured-insights/middle-east-and-africa/safeguarding-africas-food-systems-through-and-beyond-the-crisis>

Sustainability transitions in the context of pandemic: an introduction to the focused issue on social innovation and systemic impact <https://doi.org/10.1007/s10460-020-10129-2>

The Covid-19 pandemic stress the need to build resilient production ecosystems

<https://doi.org/10.1007/s10460-020-10105-w>

Viable supply chain model: integrating agility, resilience and sustainability perspectives—lessons from and thinking beyond the COVID-19 pandemic <https://doi.org/10.1007/s10479-020-03640-6>

5.5 Land

No food without land. There are many more resources on topics like land titles, land use, and land grabbing. The list only shows a few examples of resources which have a more obvious link to food system transitions/transformations to sustainability. However, they should be used as stepping stones towards exploring this crucial topic for sustainability transformations by those focusing on this field. And, they can help articulate connections between land systems and food systems.

List of references:

Delivering Sustainable Food and Land Use Systems: The Role of International Trade

<https://www.chathamhouse.org/sites/default/files/2019-10-14-HoffmanCentreTradeandFoodSystems.pdf>

Exploring the future of land use and food security: A new set of global scenarios

<https://doi.org/10.1371/journal.pone.0235597>

Greedy or needy? Land use and climate impacts of food in 2050 under different livestock futures

<https://doi.org/10.1016/j.gloenvcha.2017.09.001>

Growing Better: Ten **Critical Transitions** to Transform Food and Land Use

<https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf>

Interactions between land systems and food systems <https://doi.org/10.1016/j.cosust.2019.04.010>

Land degradation and restoration <https://ipbes.net/assessment-reports/ldr>

Land Justice: Re-imagining Land, Food, and the Commons <https://foodfirst.org/land-justice-re-imagining-land-food-and-the-commons/>

Pathways to Sustainable Land-Use and Food Systems https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/Fable-interim-report_complete-low.pdf

5.6 Local food systems and short food value chains

Since COVID-19, there is an increased interest in short food chains and local food systems. This has to do with vulnerability of food availability in cases of obstructions in trade and mobility. It is not the same as the topic of food sovereignty, but there is a connection in terms of considering the value of local food systems. There is also debate involved in terms of the appropriateness, feasibility, and desirability of securing food at local scales.

List of references:

A Theory of Planned **behaviour perspective** for investigating the role of trust in consumer purchasing decision related to short food supply chains

<https://doi.org/10.1016/j.foodqual.2017.09.012>

Building Diverse, Distributive, and Territorialized Agrifood Economies to Deliver Sustainability and Food Security <https://doi.org/10.1080/00130095.2020.1749047>

Competitiveness of Small Farms and Innovative Food Supply Chains: The Role of Food Hubs in Creating Sustainable **Regional and Local Food Systems** <https://doi.org/10.3390/su8070616>

COVID-19: are short food-supply chains more resilient in times of crisis?

<https://www.inrae.fr/en/news/covid-19-are-short-food-supply-chains-more-resilient-times-crisis>

Economic sustainability in Short Food Supply Chain. The case of the Horizon 2020 project "Short Food Supply Chain Knowledge and Innovation Network (SKIN)" <https://doi.org/10.3280/RISS2017-001011>

Food System Transformations. Social Movements, Local Economies, Collaborative Networks

<https://doi.org/10.4324/9781003131304>

From Farm to Fork: Moving to short food chains <https://zerowasteurope.eu/2020/05/from-farm-to-fork-moving-to-short-food-chains/>

From Short Food Supply Chains to Sustainable Agriculture in Urban Food Systems: Food Democracy as a Vector of Transition <https://doi.org/10.3390/agriculture6040057>

Governments, grassroots, and the struggle for local food systems: containing, coopting, contesting and collaborating <https://doi.org/10.1007/s10460-016-9765-5>
<http://www.shortfoodchain.eu/>

In Praise of Short Supply Chains <https://www.resilience.org/stories/2020-04-15/in-praise-of-short-supply-chains/>

Is the Short Food Supply Chain an Efficient Solution for Sustainability in Food Market? <https://doi.org/10.1016/j.aaspro.2016.02.036>

Learnings from Local Collaborative Transformations: Setting a Basis for a Sustainability Framework <https://doi.org/10.3390/su12030795>

Local and organic food distribution systems: towards a future agenda <http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1428157&dswid=-4118>

Local food crop production can fulfil demand for less than one-third of the population <https://doi.org/10.1038/s43016-020-0060-7>

Localizing Global Food Short Food Supply Chains as Responses to Agri-Food System Challenges <https://doi.org/10.4324/9780429449284>

Measuring the Economic, Environmental, and Social Sustainability of Short Food Supply Chains <https://doi.org/10.3390/su11154004>

Opening to Distant Markets or Local Reconnection of Agro-Food Systems? Environmental Consequences at Regional and Global Scales <https://doi.org/10.1016/B978-0-12-811050-8.00025-X>

Proceedings from the Place-Based Food Systems Conference 2018. <https://doi.org/10.5304/jafscd.2019.09A.004>

Revisiting the Glocal: the critical role of **alternative food movements** in transforming the global food system <https://lup.lub.lu.se/student-papers/search/publication/8927825>

Short Food Supply Chains (SFSC) as Local and Sustainable Systems <https://doi.org/10.3390/su12114715>

Short Food Supply Chains as drivers of sustainable development http://www.foodlinkscommunity.net/fileadmin/documents_organicresearch/foodlinks/CoPs/evidence-document-sfsc-cop.pdf

Short food supply chains as response to food shocks <https://www.fcrn.org.uk/research-library/short-food-supply-chains-response-food-shocks>

Socio-Metabolic Perspectives on the Sustainability of Local Food Systems <https://doi.org/10.1007/978-3-319-69236-4>

The resilience of long and short food chains: a case study of flooding in Queensland, Australia <https://doi.org/10.1007/s10460-015-9603-1>

The sustainability of short food supply chains, an issue of scale? Reversing the reasoning chain https://www.cairn-int.info/article-E_ECRU_367_0045--the-sustainability-of-short-food-supply.htm#

Transformative incrementalism: Planning for transformative change in local food systems <https://doi.org/10.1016/j.progress.2018.07.002>

Using local initiatives to envision sustainable and resilient food systems in the Stockholm city-region <https://doi.org/10.1016/j.gfs.2019.100334>

Visualizing the social and geographical embeddedness of local food systems <https://doi.org/10.1016/j.jrurstud.2017.06.023>

Avoiding the Local Trap - Scale and Food Systems in Planning Research <https://doi.org/10.1177/0739456X06291389>

5.7 Nutrition and health

Until recently, food and nutrition security (FNS) was a focus of many policies and initiatives. It used to be only about food, but then 'nutrition' (and health) we added as a significant upgrade in perspective. Since food systems became more of the focus, nutrition and health have become one of the desirable key outcomes of food system performance. For some, this remains the central focus of work, partly dating back to that prior orientation on FNS.

List of references:

- Changing diets** and transforming food systems <https://cgspace.cgiar.org/handle/10568/103987>
Connecting food systems for co-benefits: How can food systems combine diet-related health with environmental and economic policy goals?
https://www.euro.who.int/__data/assets/pdf_file/0007/387070/policy-brief-31-austria-eng.pdf
Food and nutrition security and sustainability transitions in food systems
<https://onlinelibrary.wiley.com/doi/full/10.1002/fes3.154>
Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)
Food systems transformations, ultra-processed food markets and the nutrition transition in Asia
<https://doi.org/10.1186/s12992-016-0223-3>
How to transition to reduced-meat diets that benefit people and the planet
<https://doi.org/10.1016/j.scitotenv.2020.137208>
Obesity and the food system transformation in Latin America <https://doi.org/10.1111/obr.12694>
Relationship between shifts in food system dynamics and acceleration of the global nutrition transition
<https://doi.org/10.1093/nutrit/nuw064>
Relationship between shifts in food system dynamics and acceleration of the global nutrition transition
<https://doi.org/10.1093/nutrit/nuw064>
Research on agro-food sustainability transitions: where are food security and nutrition?
<https://link.springer.com/article/10.1007/s12571-019-00922-1>
Sustainable diets: how ecological nutrition can transform consumption and the food system
<https://doi.org/10.1007/s10460-017-9829-1>
Transforming the food system to fight non-communicable diseases <https://doi.org/10.1136/bmj.l296>
Transitioning Toward Nutrition-Sensitive Food Systems in Developing Countries
<https://doi.org/10.1146/annurev-resource-100516-053552>

5.8 Cities and urban systems

In an urbanizing world with an increasing percentage of the world population living in cities, there is a need to develop specific approaches for engaging with food system transitions/transformation in that context and for that context. It relates to something that applies more generally: food systems feature at different levels and scales and need to be understood as nested systems, each having different characteristics and each having their own internal orientations.

List of references:

- Alternative food networks and opportunities for transformation towards a sustainable and resilient urban food system <https://hdl.handle.net/10289/13570>
Business Model Innovation and Transition to a Sustainable Food System: A Case Study in the Lisbon Metropolitan Area https://doi.org/10.1007/978-3-030-40390-4_6
Cities and the circular economy for food
<https://www.ellenmacarthurfoundation.org/assets/downloads/Cities-and-the-circular-economy-for-food-1.pdf>
Covid-19 vs City-20. Special Issue of TeMA - Journal of Land Use, Mobility and Environment, twenty-seven contributors of international researchers and technicians in form of scenarios, insights, reasoning and research on the relations between the City and the impacts of Covid-19 pandemic
<http://www.tema.unina.it/index.php/tema/>

Edible cities – An innovative nature-based solution for urban sustainability transformation? An explorative study of urban food production in German cities
<https://doi.org/10.1016/j.ufug.2020.126604>

European cities leading in urban food systems transformation: connecting Milan & FOOD 2030
<https://fit4food2030.eu/wp-content/uploads/2019/10/European-cities-leading-in-urban-food-systems-transformation.pdf>

Grassroots Initiatives as Sustainability Transition Pioneers: Implications and Lessons for Urban Food Systems <https://doi.org/10.3390/urbansci2010023>

Integrating a Food Systems Lens into Discussions of Urban Resilience - A Policy Analysis
<https://doi.org/10.5304/jafscd.2020.093.021>

Sustainability and **resilience** of transformation in the urban century
<https://www.nature.com/articles/s41893-019-0250-1>

Sustainability Assessments of Urban Systems <https://doi.org/10.1017/9781108574334>

The challenge of **systemic food change**: Insights from **cities**
<https://www.sciencedirect.com/science/article/pii/S0264275118305985>

The role of cities in the transformation of food systems: Sharing lessons from Milan pact cities Urban Food Movements and Their Transformative Capacities
<http://www.milanurbanfoodpolicypact.org/wp-content/uploads/2018/10/CA0912EN.pdf>

Urban food systems as vehicles for sustainability transitions <https://doi.org/10.2478/bog-2018-0019>

Urban Transformations to Sustainability <https://www.cambridge.org/core/books/urban-planet/urban-transformations-to-sustainability/254B6D57152904847A82F8383C653560>

6 Global initiatives

The following is a selected listing of a (representation of the) wide range of initiatives which inform or are involved in (food) system transitions/transformations to sustainability. They show concrete ways of contributing to the same by a range of different actor groups. Some are focusing on enabling alignment, coherence, complementarity, and synergy between various efforts. Others are focusing on guiding good practice, due diligence, and shaping responsible action. Yet others articulate their work more along the lines of providing "solutions" through technology and innovation. They represent different approaches and not necessarily work in the same direction. This is why it is important to have the Sustainable Development Goals (SDGs) as a shared reference framework. They do not, however, articulate *how* (pathways) particular targets will be met, nor a shared perspective on trade-offs and side-effects involved in focusing on part of the SDGs only. This, then, points back to the pivotal role of integrated governance of food system transitions/transformations to sustainability.

List of references:

A European Green Deal https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

AGRA. AGRA exists to fulfill the vision that Africa can feed itself and the world, transforming agriculture from a solitary struggle to survive to a business that thrives <https://agra.org/>

4th International **Conference on Global Food Security** Achieving local and global food security: at what costs? <http://www.globalfoodsecurityconference.com/>

C40 food system network. https://www.c40.org/networks/food_systems The C40 Food Systems Network, in partnership with EAT Initiative, convenes city officials to work together to achieve solutions to their most pressing food systems challenges. Building on the work commenced by the Milan Urban Food Policy Pact, the Food Systems Network supports citywide efforts to create and implement integrated food policies that reduce greenhouse gas (GHG) emissions, increase resilience and deliver health outcomes.

Civil Society and Indigenous Peoples' Mechanism for relations with the UN Committee on World Food Security <http://www.csm4cfs.org/>

Collaborative Framework for Food Systems Transformation - A **multi-stakeholder pathway** for sustainable food systems; https://www.oneplanetnetwork.org/sites/default/files/un-collaborative_framework_for_food_systems_transformation_final.pdf

Committee on World Food Security/HLPE - High Level Panel of Experts on Food Security and Nutrition <http://www.fao.org/cfs/cfs-hlpe/en/>

DRIFT for transition <https://drift.eur.nl/> DRIFT is a leading research institute in the field of sustainability transitions. We develop and share transformative knowledge to support people, cities, sectors and organisations to engage proactively with transitions. DRIFT has four main activities that complement, ground and inspire each other: academic research, consultancy, education and public dialogue & debate.

Ecologic Institute: Science and Policy for a Sustainable World <https://www.ecologic.eu/>

EAT is the science-based global platform for food system transformation <https://eatforum.org/> EAT is the science-based global platform for food system transformation.

Eatable adventures. We identify and support the most innovative European food start-ups and help them to thrive in global markets. <https://www.eatableadventures.com/>

EIT Food. EIT Food is Europe's leading food innovation initiative, working to make the food system more sustainable, healthy and trusted <https://www.eitfood.eu/>

EU Food System Hubs Innovating towards Fast Transition by 2030 <https://cordis.europa.eu/project/id/862716>

Finnish Environment Institute **The Just Transition** – JUST FOOD project studies ways to transition to a climate-smart and healthy food system in a sustainable, acceptable and just manner. <https://www.justfood.fi/en-US>

Food & Business Knowledge Platform <https://knowledge4food.net/>

Food Action Alliance <https://www.weforum.org/projects/food-action-alliance>

Food forever <https://www.food4ever.org/> Helping to bring biodiversity back to the core of our food systems

Food system dialogues <https://foodsystemsdialogues.org/> "Food Systems Dialogues offer a unique opportunity to share perspectives, understand positions and elevate proposals that can transform food systems"

Food systems dashboard. The Food Systems Dashboard combines data from multiple sources to give users a complete view of food systems. Users can compare components of food systems across countries and regions. They can also identify and prioritize ways to sustainably improve diets and nutrition in their food systems. <http://www.foodsystemsdashboard.org/>

FOOD2030 platform <https://fit4food2030.eu/> The FOOD 2030 Platform is based on three inter-linked structures: An EU think tank, policy labs, and city labs. It is meant to strengthen R&I policy coherence and alignment, responding to a variety of actors' needs; Build competences of current and future researchers, entrepreneurs, policy-makers, and society at large; and Raise awareness, of the FOOD 2030 policy framework specifically, and for the many food-related challenges in general.

Foodprint – making sense of food. <https://foodprint.org/>

FoodSHIFT 2030; we need a transformation of the food system in Europe
<https://foodshift2030.eu/about/>

Foodtank. **Think tank for food.** <https://foodtank.com/> "We're building a global community for safe, healthy, nourished eaters. We aim to educate, inspire, advocate, and create change. We spotlight and support environmentally, socially, and economically sustainable ways of alleviating hunger, obesity, and poverty and create networks of people, organizations, and content to push for food system change"

GEF programme - A future food system for healthy human beings and a healthy planet
<https://www.thegef.org/sites/default/files/publications/STAP%20Report%20on%20food%20system.PDF>

Global alliance for the future of food <https://futureoffood.org/> "An alliance of mostly private foundations, we are challenging ourselves to work in new and different ways that allow us to realize the benefits of collective action and tackling the complexity of the food system together."

Global forum for food and agriculture <https://www.gffa-berlin.de/en/>

Global donor platform for rural development <https://www.donorplatform.org/homepage.html>

Grow Africa. Grow Africa works to increase private sector investment in agriculture, and accelerate the execution and impact of investment commitments <https://www.growafrica.com/who-we-are>

HEAL Platform for Real Food <https://healfoodalliance.org/platformforrealfood/>

IFOAM Organics international. Working to bring true sustainability to agriculture across the globe.
<https://www.ifoam.bio/>

Institute for European Environmental Policy. The Institute for European Environmental Policy is a sustainability think tank <https://ieep.eu/>

International Sustainability **Transition conferences** <http://ist2020.at/> Theme: Governance in an Era of Change – Making Sustainability Transitions Happen

IPES-FOOD <http://www.ipes-food.org/> An expert panel guided by new ways of thinking about research, sustainability, and food systems

LEAP Agri. LEAP-Agri is a joint Europe Africa Research and Innovation (R&I) initiative related to Food and Nutrition Security and Sustainable Agriculture (FNSSA) <https://www.leap-agri.com/>

LEAP4FNSSA. Long-term EU-AU Research and Innovation Partnership for Food and Nutrition Security and Sustainable Agriculture <https://www.leap4fnssa.eu/>

Metabolic - We use systems thinking to tackle global sustainability challenges
<https://www.metabolic.nl/>

Milan Urban Food Policy Pact <http://www.milanurbanfoodpolicypact.org/> An international pact signed by 210 cities from all over the world with more than 450 million inhabitants.

NWO <https://www.nwo.nl/en/research-and-results/programmes/enw/transition-to-a-sustainable-food-system/index.html>

One Planet Network <https://www.oneplanetnetwork.org/sustainable-food-system> The Sustainable Food Systems (SFS) Programme is a multi-stakeholder partnership focused on catalyzing more sustainable food consumption and production patterns. Our shared vision enables our partners to collaborate on joint initiatives, which range from normative, advocacy and policy support activities, to research and development projects as well as on-the-ground implementation

activities that address our food systems challenges. The Programme promotes a holistic approach, taking into account the interconnections and trade-offs between all elements and actors in food systems.

PRI Principles for Responsible Investment <https://www.unpri.org/>

Redirecting investment for a global food system that is sustainable and promotes healthy diets https://www.g20-insights.org/policy_briefs/redirecting-investment-for-a-global-food-system-that-is-sustainable-and-promotes-healthy-diets/ [G 20 policy]

Responsible Agricultural Investment <https://responsibleagroinvestment.org/>

Scaling Up Nutrition (SUN) <https://scalingupnutrition.org/>

Stockholm Environment Institute <https://www.sei.org/>

Stockholm Resilience Centre – Sustainability Science for Biosphere Stewardship <https://www.stockholmresilience.org/>

SUSFANS - <https://www.susfans.eu/> SUSFANS' overall objective is to build the conceptual framework, the evidence base and analytical tools for underpinning EU-wide food policies with respect to their impact on consumer diet and their implications for nutrition and public health in the EU, the environment, the competitiveness of the EU agri-food sectors, and global food and nutrition security.

Sustainability Transitions **Research Network** <https://transitionsnetwork.org/> International network of scholars interested in the sustainable transformation of socio-technical systems.

Sustainable Agriculture & Food Systems **Summit** <https://safs2020.com/>

Sustainable Cities Platform <https://sustainablecities.eu/home/>

Sustainable food systems and diets: a review of **multi-stakeholder initiatives**.

<https://www.wwf.org.uk/sites/default/files/2018-10/59078%20Sustainable%20food%20systems%20report%20-%20ONLINE.pdf>

Systems thinking for transitions to sustainability <https://www.metabolic.nl/>

<https://www.metabolic.nl/publication/global-food-system-an-analysis/>

The EAT-Lancet Commission on Food, Planet, Health <https://eatforum.org/eat-lancet-commission/>

Transformational investing in food systems (TIFS) <https://www.tifsinitiative.org/>

Transforming Food Systems Under a **Changing Climate** <https://www.transformingfoodsystems.com/>

Over 100 partners have come together in a new initiative to identify pathways for food systems transformation

UN Global Compact. Uniting business for a better world. <https://www.unglobalcompact.org/>

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Report WCDI-20-125

Wageningen Centre for Development Innovation supports value creation by strengthening capacities for sustainable development. As the international expertise and capacity building institute of Wageningen University & Research we bring knowledge into action, with the aim to explore the potential of nature to improve the quality of life. With approximately 30 locations, 6,500 members (5,500 fte) of staff and 12,500 students, Wageningen University & Research is a world leader in its domain. An integral way of working, and cooperation between the exact sciences and the technological and social disciplines are key to its approach.



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