



FIT4FOOD2030: Future-proofing Europe's Food Systems with Tools for Transformation and a Sustainable Food Systems Network

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Abstract

Food systems are not fit for purpose, transgressing planetary boundaries, causing unhealthy consumption patterns and are rife with inequality. Research and Innovation (R&I) are central to tackling these food systems challenges, yet R&I systems are equally not fit for purpose, often lacking systemic and participatory approaches to food systems transformation. Therefore, there is a need for novel R&I approaches that adopt systemic and more participatory methods to engage with a wider range of food systems stakeholders. However, the lack of competencies and tools concerning novel R&I approaches for food systems transformation is a key hindrance to the deployment of such approaches in practice. These competencies and tools are vital for guiding and supporting food systems stakeholders dedicated to contributing to its transformation whether they are policymakers, researchers or citizens. This article presents the tangible results of the European (EU) Horizon 2020 funded *FIT4FOOD2030* project. As a response to the challenges food and R&I systems face as well as the gap in competencies and tools surrounding these issues, the project has developed a growing online hub of *Tools for Transformation* applicable to a broad range of transformation challenges and contexts (e.g. food, health or energy) and a *Sustainable Food Systems Network* to equip food system stakeholders with practical hands-on materials to 'do' food systems transformation.

KEYWORDS

Farm to Fork strategy, FOOD 2030, food systems, responsible research and innovation, sustainability, systems approach

FUTURE-PROOFING EUROPEAN FOOD SYSTEMS THROUGH RESEARCH AND INNOVATION

Food systems must be transformed urgently to stay within planetary boundaries (Rockström et al., 2020).

Globally, we are confronted with an extensive list of urgent food systems-related problems. Severe environmental problems include resource scarcity, biodiversity loss, decreased soil quality as well as excessive greenhouse gas emissions (FAO, 2019; Willett et al., 2019). Unhealthy consumption patterns have

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led to dietary risks becoming the third largest cause of death globally and malnutrition a leading risk factor for healthy life years lost (GBD, 2020). Additionally, the current COVID-19 pandemic has further amplified the interrelationships between health and food systems, highlighting the fragility and complexity of our current food systems and the urgent need for transformation towards systems that have the ability to adapt to future shocks, including pandemics and natural disasters, as mentioned in the European Commission (EC)'s Farm to Fork Strategy (European Commission, 2020a).

Food systems are best seen as complex adaptive systems characterised as multi-stakeholder, multi-level, and multi-functional and exhibiting dynamics such as trade-offs, synergies and systemic feedback loops (Zhang et al., 2018). The interactions between all these elements and processes are key to understanding food systems dynamics (Ingram, 2011). Yet directing complex system transformation is challenging, since it involves managing these interactions (Grin et al., 2010), integrating divergent and conflicting perspectives on desired outcomes of, and pathways towards, sustainable futures (van Bers et al., 2019), restructuring existing power relations to foster transformative change (Kok et al., 2021), and aligning responses at various levels (from local to global; Moragues-Faus et al., 2017).

Traditionally, Research and Innovation (R&I) contribute to the production of new knowledge and to progressing innovation through the development or improvement of products, processes and services (European Commission, 2017). However, it is increasingly argued that R&I can also play a crucial role in identifying and supporting high-impact solutions to persistent food systems-related challenges and can contribute to systems transformation (Den Boer et al., 2021; Herrero et al., 2020). While traditional R&I efforts have been successful in contributing to solutions within specific, compartmentalised parts of food systems, such as agricultural production or consumption, engagement with wider parts of food systems is still lacking. Current R&I systems are not fully equipped to contribute to food systems transformation, precisely because traditional approaches are unable to effectively address the complex dynamics of food systems. This can result in undesired and unintended consequences of the implementation of (socio-technical) innovations (Genus & Stirling, 2018; Gibbons, 1970; Rosner, 2004).

To deal with the inextricable linkages within and beyond food systems, the associated governance challenges, and to unlock the potential of R&I to serve as a catalyst for change, R&I systems should be inclusive, transparent, intersectoral, multi-stakeholder, multi-factorial, interdisciplinary and transdisciplinary (Den Boer et al., 2021). Alongside traditional R&I, there is a need for novel R&I efforts that adopt systemic approaches where different stakeholder groups, sectors, governance levels, and policy fields are included during

the whole R&I process (Abson et al., 2017) to align outcomes with the values, needs and expectations of society (European Commission, 2014). This also calls for processes that involve co-development of knowledge where reflection upon different values, perspectives, interests and power imbalances are encouraged (Popa et al., 2015). If well designed and executed, such multi-stakeholder processes could lead to more socially relevant knowledge and innovations, provide legitimacy to R&I processes and outcomes, stimulate learning and reflection among stakeholders and contribute to the democratisation of R&I (Lang et al., 2012; Schmidt et al., 2020). However, such transformative approaches are far from easy to adopt in practice. They require stakeholders to both fundamentally think and act in different ways and deal with systemic environments – skills which are barely stimulated in more traditional R&I approaches (Fazey et al., 2020). This means that for R&I systems to more effectively contribute to transforming food systems, R&I systems themselves must also be transformed towards those that better facilitate transdisciplinary and inclusive R&I efforts. Thus, there is a need for a double transformation in both food and R&I systems (Kok et al., 2019). A particular challenge affecting both the adoption of more inclusive and transdisciplinary R&I approaches and food systems transformation is the lack of competences (knowledge, skills and attitude) among R&I practitioners (Carriers & Gartzlaff, 2019) and tools to deploy such approaches in practice. Therefore, it is vital to encourage competence development among different stakeholders, for example researchers and policymakers (Ingram et al., 2020) and the creation and uptake of experimental and participatory methods and tools that facilitate the adoption of more inclusive practices (Hebinck et al., 2018; Pereira et al., 2018). Such tools are important for guiding and supporting stakeholders dedicated to contributing to the urgent and difficult task of stimulating food and R&I systems transformation by helping them create 'transformative spaces for reflection and action' (Pereira et al., 2018).

This paper introduces the FOOD 2030 policy framework and the accompanying FIT4FOOD2030 project (2017–2020), a response to the challenges of transforming both food and R&I systems. It describes the *Tools for Transformation* developed by FIT4FOOD2030 to provide a multitude of stakeholders with hands-on resources to 'do' food systems transformation using more inclusive R&I methods. Examples of how these tools could be used in practice based on the experiences of the project's 25 Labs are also presented. Finally, we introduce the *Sustainable Food Systems Network* (<https://sustainable-food-systems-network.mobilize.io/registrations/groups/42013>), which aims to become an accelerator of change by stimulating stakeholders at multiple levels to experiment with and disseminate tools for food systems transformation.

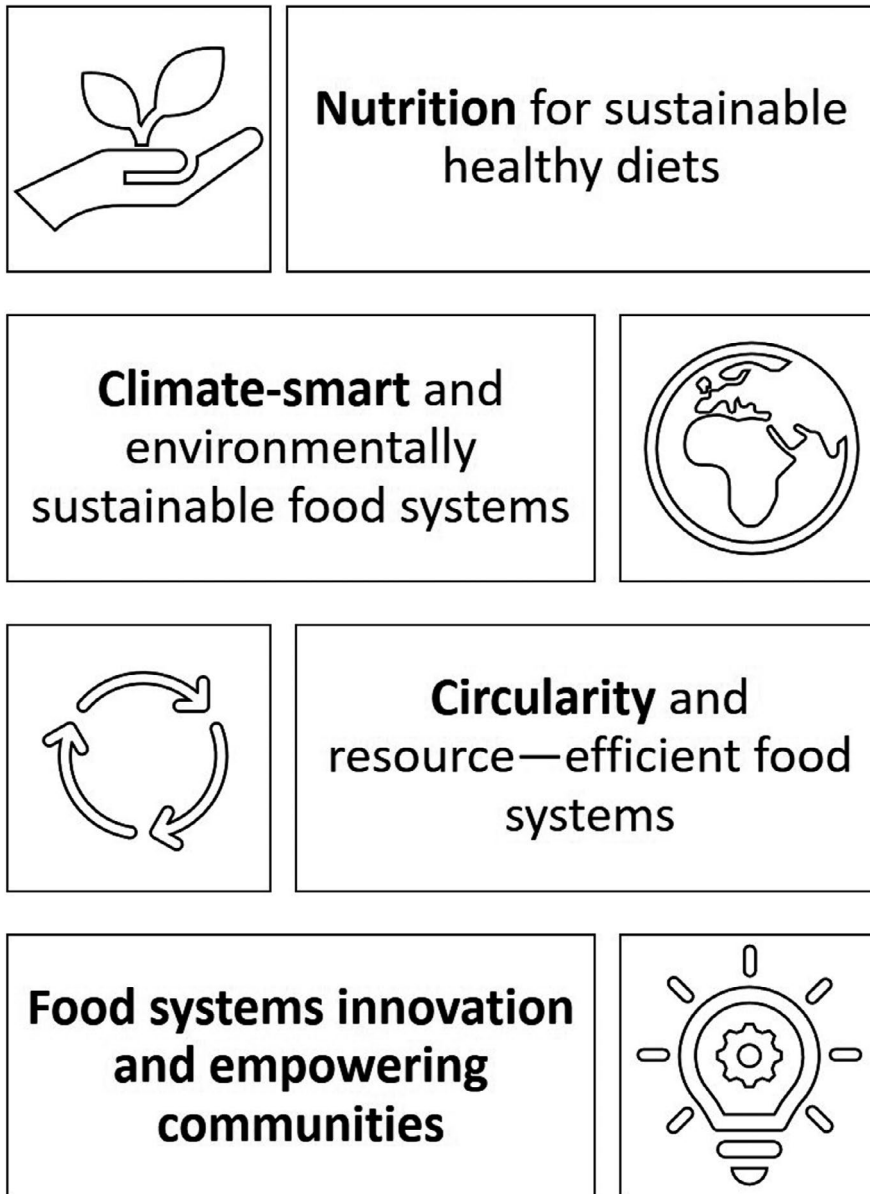


FIGURE 1 FOOD 2030 four Food and Nutrition Security priorities (Source: European Commission, 2018)

IMPLEMENTING FOOD 2030: *FIT4FOOD2030*

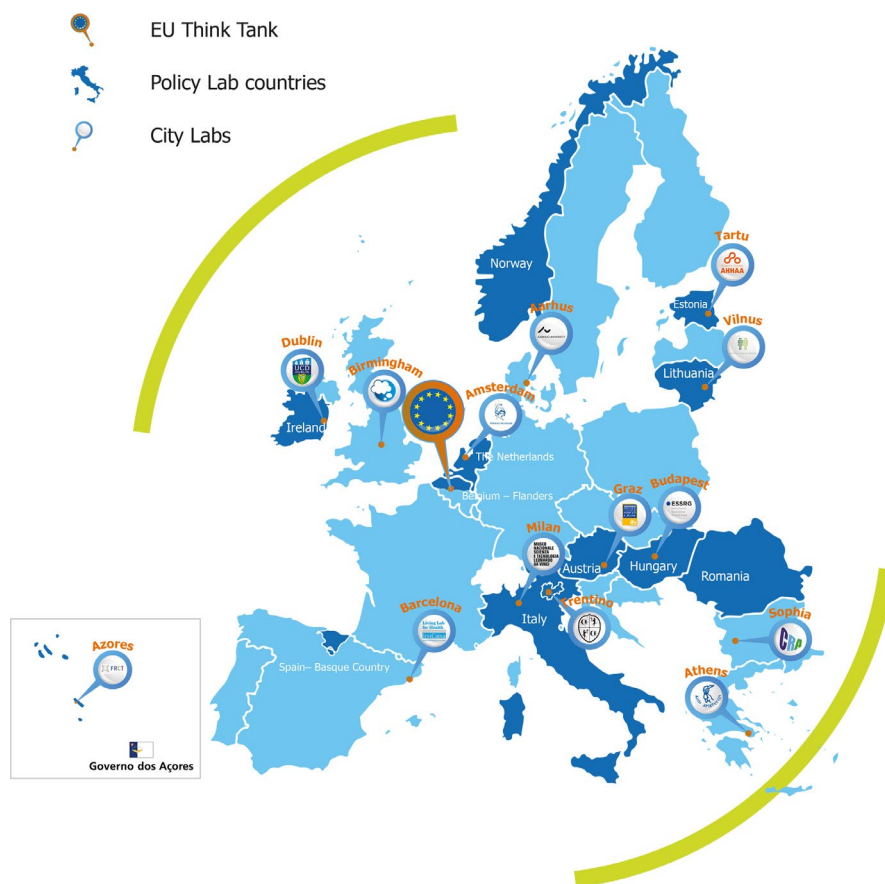
‘FOOD 2030’ is the EC’s R&I policy framework responding to international policy developments [e.g. Sustainable Development Goals and Conference of the Parties (COP) 21 Commitments]. The framework proposes a systemic food systems approach to R&I policy, bringing together and providing direction to a fragmented EU R&I landscape (European Commission, 2020b). Driven by transdisciplinary research, multi-level innovation and investment, open science and international collaboration, the FOOD 2030 R&I policy framework aim to prioritise and integrate R&I within four key Food and Nutrition Security (FNS) priorities in order to future-proof European food systems, making

them sustainable, resilient, diverse, inclusive and competitive for the benefit of society (Figure 1; European Commission, 2018).

FIT4FOOD2030, a Coordination and Support Action project, was established to facilitate the further development and support of the implementation of the FOOD 2030 policy framework, through the transformation of R&I systems at European, national and local levels (*FIT4FOOD2030*, 2019). *FIT4FOOD2030* specifically aimed to contribute to (1) raising awareness of the FOOD 2030 priorities, (2) building competencies among current and future researchers, entrepreneurs, policymakers and society at large to contribute to system transformation, and (3) improving the coherence and alignment of R&I policies on FNS. As such, *FIT4FOOD2030* can be considered a multi-level

FIGURE 2 Overview of FOOD 2030's Platform and their geographical locations [Colour figure can be viewed at wileyonlinelibrary.com]

FOOD 2030 Platform



intervention acting upon multiple leverage points¹ to trigger transformation in the R&I systems coupled to EU food systems (see Kok et al., 2019). To achieve its mission, *FIT4FOOD2030* brought together 16 institutions from across Europe, representing universities, research funders, technology and innovation platforms, industry networks and science engagement organisations to create a sustainable, multi-stakeholder platform called the FOOD 2030 Platform, mobilising a network of European food system stakeholders.

The FOOD 2030 platform

Guiding the project's objectives was the platform's three multi-level structures: the European Think Tank (EU-TT), Policy Labs and City and Food Labs, which fostered transformation across all levels (local to national; Figure 2). These structures interacted regularly to exchange information and learnings, linking the project's results to the wider EU level. Building upon this

invaluable network and the expected R&I needs of the EU Green Deal and Farm to Fork Strategy, the project has now launched its new online platform called the *Sustainable Food Systems Network* (<https://sustainable-food-systems-network.mobilize.io/registrations/groups/42013>; see later section).

Innovative Labs for food systems transformation

In efforts to facilitate transitions towards sustainable systems, real-life laboratories such as Living Labs, (Urban) Transition Labs and Real-World Labs have emerged as instruments to tackle sustainability challenges through multi-stakeholder experimentation (McCrorry et al., 2020; Schöpke et al., 2018). While there exists no uniform definition for these 'Labs', they are considered spaces that facilitate experimentation relevant for real-life contexts and are characterised by their equal involvement of diverse stakeholders in creating concrete and sustainable societal value (Almirall et al., 2012; Bulkeley et al., 2016; Schöpke et al., 2018). It has been shown that such multi-stakeholder Labs can lead to a wide variety of (transformative) impacts, for instance in building local transformative networks,

¹Here we follow Meadows' (1999) conceptualisation of creating systemic change in complex systems by intervening at leverage points in the system where intervention is most likely to trigger fundamental change. Those leverage points can be on the level of parameters, feedback, design and intent, see also Fischer and Riechers (2019).

experimenting and designing novel innovations and activities, connecting and accelerating ongoing initiatives, and integration into policy (agendas; for examples see Bergmann et al., 2021; McCrory et al., 2020; Nevens et al., 2012).

Central to the FOOD 2030 Platform are 25 such multi-stakeholders real-life context Labs. These Labs have built networks fostering sustainability transitions through food systems interventions on the local/regional (City Labs, Food Labs) and national levels (R&I Policy Labs; Kok et al., 2019). Through the use of participatory methodologies and reflective learning², the project's Labs brought together networks of diverse groups of stakeholders (policymakers, researchers, educators, practitioners and citizens), including stakeholder groups often excluded [e.g. civil society organisations (CSO), farmers].

Through their work with *FIT4FOOD2030*, the Labs' host organisations and coordinators received a general framework, adapted to the individual Lab's needs, host institution's expertise, and the established local partnerships, as well as training, coaching and spaces to reflect. A number of tools were developed to support the Labs in their efforts to increase system understanding and foster transformation, such as setting up stakeholder networks, understanding local food systems and educational needs of R&I for food systems stakeholders, and identifying underlying barriers and opportunities for transformation (see also European Commission 2021 for additional key learnings and recommendations from the project). These tools were later applied by the lab coordinators within their labs with multiple stakeholders and updated based on feedback and are available as *Tools for Transformation* in the *FIT4FOOD2030* Knowledge Hub (see later section).

City and Food Labs

City Labs were hosted by diverse organisations, from science centres and museums to previously established Living Labs. The concept was later expanded to seven more Food Labs representing peri-urban settings, differing slightly in their roles and timelines. These were hosted by universities, research centres, an NGO and a museum. The Labs' commonality included their commitment to building competences for more inclusive local food systems R&I by developing and piloting hands-on and local-oriented (in)formal education and training modules for students, researchers and professionals, such as navigating the complexity of local food systems, building critical thinking and future studies abilities and enabling transdisciplinary collaboration. The Labs co-created 19 modules (included

in *Tools for Transformation*), which have been piloted by 800+ citizens and used by 2000+ recipients. For instance, City Lab Amsterdam transformed courses for university students, including the Bachelor's course, 'Analysis of Governmental Policy' and the Master's course, 'Governance for Global Health', resulting in policy recommendations by the students to the Food Council of the Metropolitan Region Amsterdam and the Municipality of Amsterdam, respectively. Other modules such as 'Eat it, Don't Skip it!' developed the entrepreneurial skills of students, which led to a business model for healthy, sustainable 'grEATboxes' (snack boxes) by high school students (City Lab Athens) and a business plan to establish school Green Zones, providing spaces for students to eat healthy sustainable meals, recycle and share knowledge about food systems (City Lab Sofia; Fenollosa & Paca, 2020). Through this process, the City and Food Labs have contributed to transformative competence building among the Lab coordinators as well as the various stakeholders involved (Kok et al., 2019).

R&I Policy Labs

The project's 11 Policy Labs responded to the call to develop innovative R&I policies (for example see Schot & Steinmueller 2018) and aimed to 'increase the alignment of the public/private [R&I] (such as policies, programmes and investment schemes) to [FNS] and the FOOD 2030 goals' (Wagner, 2019). They operate on national or regional levels and are coordinated by governmental policymakers with formal (written) support of multiple national ministries related to food and R&I. The Policy Labs were set up as participatory and experimental spaces, bringing together a diverse group of food system stakeholders. Through a series of meetings, Policy Labs and their (growing) networks analysed current food systems, related R&I landscapes, barriers and opportunities and worked to strengthen R&I policy by defining a shared vision and translating this into concrete actions (or experiments) towards more alignment and impact on the transformation of food systems. For this purpose, they employed innovative tools such as the impact pathways exercise to co-design robust strategies and concrete measures together with diverse stakeholder groups (see Box 7). Concrete outputs of the R&I Policy Labs include the launch of transdisciplinary food systems calls, development of a holistic food systems research agenda and feeding into a consumer information campaign on food waste. Equally as important are the less tangible impacts, such as raising awareness about the systems approach and initiating or improving collaboration between ministries, as well as other food system actors. These novel R&I Policy Labs have shown their effectiveness as tools themselves in a variety of settings to increase the impact of

²For more on the process see Svare et al., (2020).

TABLE 1 Tools for Transformation categories and their relation to FIT4FOOD2030 priorities

Overarching FIT4FOOD2030 priorities	Types of tools	Tool categories
Establishing Labs and developing innovative Research & Innovation (R&I) policies on Food and Nutrition Security	Process-oriented tools	Running a Lab R&I policy alignment and innovation
Increasing competencies and awareness of food system stakeholders	Awareness-raising-oriented tools	Exploring and understanding the food system
Raising awareness of the FOOD 2030 priorities		Educating or training people for food systems transformation

R&I systems on food systems transformation, in particular through improving policy coherence (Kok et al., 2019).

EU Think Tank

The EU-Think Tank (EU-TT) brought together 15 members, representing a wide range of food systems' stakeholders (e.g. nutrition, food policy, agriculture, R&I). The group acted as a strategic hub and sounding board to the project, proactively drawing overarching lessons, translating them into EU level policy briefs (Gill et al., 2018; 2019; 2020; Sonnino et al., 2020) and working to facilitate communication and dissemination between the EC and the FOOD 2030 platform.

Trends, policies and breakthroughs

The activities of the Labs and EU-TT were supported by research into a series of analytical tools and data sets that served as instruments and building blocks for stakeholder engagement, vision development, systems understanding, road-mapping and action planning throughout the project as well as to inform future R&I activities on FNS. These tools provide insights into food system trends,³ EU and national food systems-related policies, and potential breakthroughs⁴ in food systems R&I. For example, the collection of food system trends has evolved into an engaging card game (https://fit4food2030.eu/wp-content/uploads/2018/11/FIT4FOOD2030-Trends-cards-landscape_Annual-MeetingNotes_card-game.pdf), as well as an extensive

inventory of trends (<https://fit4food2030.eu/trends-in-the-food-system/>) compiled through stakeholder interviews, desk research, a workshop and online consultations (Wepner et al., 2018). In addition, an overview of European food policies (<https://knowledgehub.fit4food2030.eu/resource/mapping-eu-food-system-policies/>) has been collated into a free database and a card game (Biondi et al., 2019). These games can facilitate group discussions on the topic of food systems and the related challenges. Lastly, an interactive Inventory of possible R&I breakthroughs (<https://fit4food2030.eu/inventory-of-breakthroughs/>) has been published relating to identified showcases and trends (Lazaro-Mojica et al., 2019).

FIT4FOOD2030 TOOLS FOR TRANSFORMATION: HANDS-ON MATERIALS FOR FUTURE-PROOFING EUROPE'S FOOD SYSTEMS

The systemic transformation towards the implementation of transdisciplinary and inclusive R&I practices in food systems requires the inclusive convening of local, national and international stakeholders from across food systems. These different food systems stakeholders can take on the role of facilitators or change agents and enable transformation through collaboration, planning and problem-solving. Nonetheless, bringing together all relevant stakeholders effectively and successfully requires training and tools.

The training tools developed for lab coordinators, the modules developed by FIT4FOOD2030's Labs, the work on trends, R&I breakthroughs, the overview of European policies, along with communication and dissemination materials all represent the hands-on and FIT4FOOD2030 tested *Tools for Transformation*, which have been collated to form a growing repository called the *FIT4FOOD2030 Knowledge Hub* (<https://www.knowledgehub.fit4food2030.eu/>). These tools aim to

³FIT4FOOD2030 defines a 'trend' as a general direction of a development over time.

⁴FIT4FOOD2030 defines R&I 'breakthroughs' as potential, significant achievements that can create large impacts on current initiatives in the field of FNS and lead to radical changes in the food system, making it more sustainable and resilient.

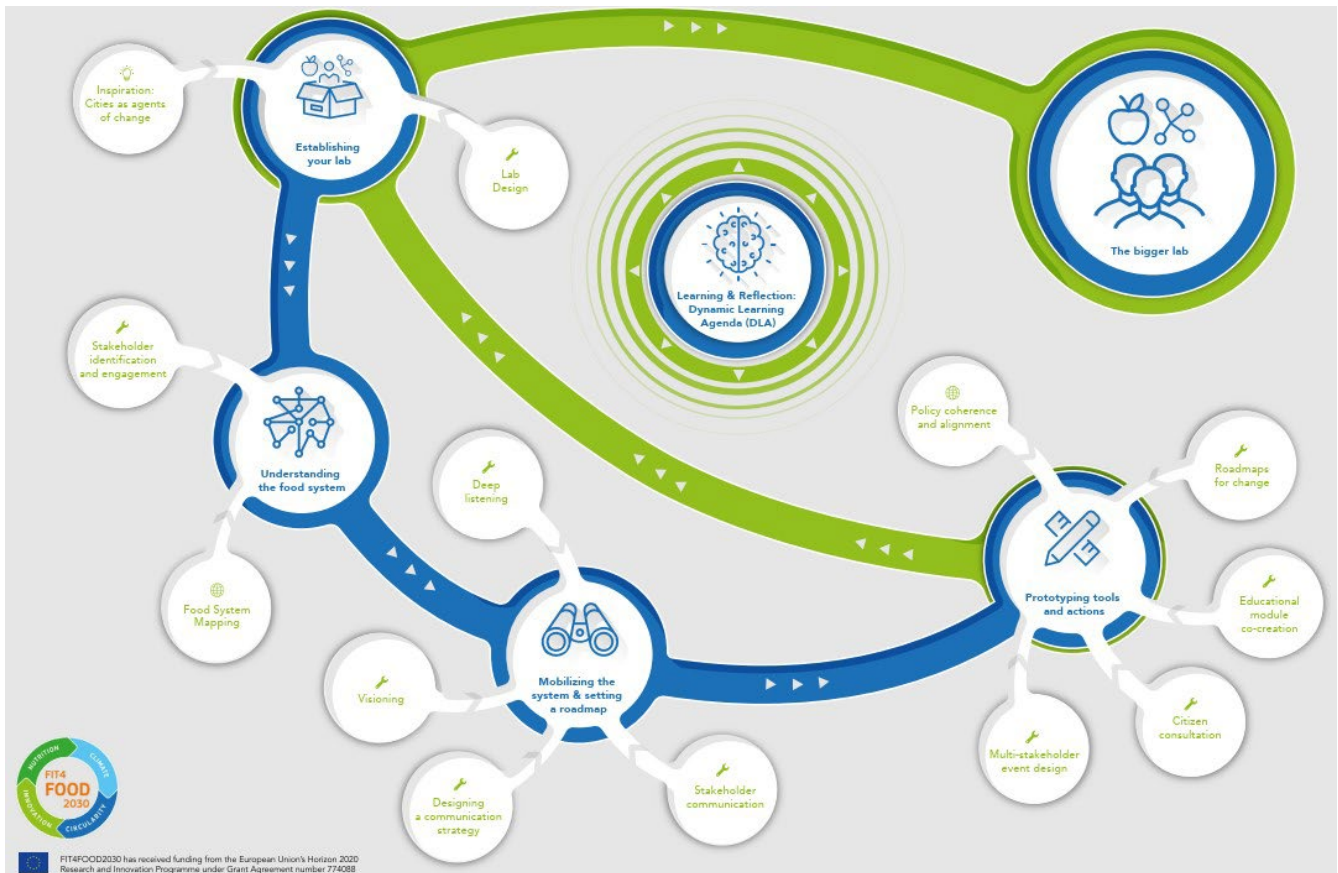


FIGURE 3 Visual representation navigating the relationship between the phases required to set up and run a city or food lab (blue circles) and the *FIT4FOOD2030 Tools for Transformation* (green circles) used in the process. The Dynamic Learning Agenda is continuously updated and is therefore part of all phases (Section 3.3). Visual representations of the additional categories can be found on *FIT4FOOD2030 Knowledge Hub*. (Developed by MG, CP, etc. Graphic design by Global Concept Consulting. This illustration is licensed under a Creative Commons Attribution-No Derivatives 4.0 International License.) [Colour figure can be viewed at wileyonlinelibrary.com]

provide practical advice, manuals, guidelines and formats for online and in-person interactions that cover a range of topics on food systems transformation and R&I in the contexts of the users' local or national food systems. They were developed in response to the project's ambitions (Table 1) and as a response to the evolving needs *FIT4FOOD2030* identified by working with the Labs and other R&I food system stakeholders. While the four categories of tools are classified into two types of tools, tools within categories such as 'Exploring and understanding the food system' could also be used as process-oriented tools.

The *FIT4FOOD2030 Knowledge Hub*⁵ is expected to contain around 80 *Tools for Transformation* and includes:

- short exercises for collaborative reflection and co-creation;
- training and reflection modules for professionals;
- educational modules and videos;

- data sets on food system trends, breakthroughs and policies;
- webinars; and
- policy briefs.

Using the *FIT4FOOD2030 Tools for Transformation*

The *FIT4FOOD2030 Tools for Transformation* are freely available to stakeholders and adapted or adaptable to varying levels of expertise, interests, aims and contexts. While many of the tools were developed as part of a sequence, all tools have been designed to be used as individual tools (Figure 3). While the tools were designed for transformation of R&I in food systems, they are applicable to other transformation processes that address social, economic and environmental challenges and are in need of innovations, such as health-, or energy-related transformation processes. In all these areas, transformation facilitators are faced with complex issues that cut across sectors: stakeholders who

⁵The Knowledge Hub is currently (March 2021) a growing repository.

have different opinions or competing interests, and significant uncertainties with regards to the way forward for scientific, technological and social change.

Stakeholders interested in adopting more inclusive R&I to contribute to food systems transformation more effectively may find that their traditional R&I roles (e.g. researcher, policymaker, manager, educator) increasingly require complementary new roles, such as those of 'change agent', 'knowledge broker' and 'process or transformation facilitator' (Fazey et al., 2018; Wittmayer & Schöpke 2014). While these new roles require specific sets of competences (e.g. systems or anticipatory thinking), it could be argued that through the use of tools, such as *FIT4FOOD2030's Tools for Transformation* and the process of competency development, these roles can be adopted by traditional R&I stakeholders. In practice, this means that the stakeholders' roles become less clearly defined and could lead to conflicting aims and role understanding (Wittmayer & Schöpke 2014). For example, researchers and policymakers can actively encourage a 'process-oriented and multi-stakeholder approach' by adopting these new roles and the sets of required competences (e.g. transdisciplinary collaboration, conflict resolution, systems thinking) in practice (Wittmayer & Schöpke, 2014). Depending on the specific (institutional) context, the aims of the process and the required competences, a stakeholder may decide which role to adopt and which set of tools to use.

The sections below provide an overview and introduction to some of the *Tools for Transformation* according to four categories; Running a Lab, Improving R&I policy coherence and alignment, Exploring and understanding food systems, and Educating or training people for food systems transformation. As the *FIT4FOOD2030 Knowledge Hub* continues to evolve, users are invited to interact on the *Knowledge Hub* and *Sustainable Food Systems Network* (see later section) by posting their experiences and tips for using the tools in a variety of contexts.

Process-oriented tools

Running a Lab

Labs are promising instruments used for tackling complex problems that more traditional governance efforts do not manage to solve. For policymakers, researchers or educators who aim to make profound and lasting impacts on, for example, R&I and food systems, setting up a Lab can be a good tool for transformative change. However, 'running a Lab' requires the ability to connect and engage a diverse set of stakeholders, while also developing participatory and experimental spaces to test novel ideas and nurture innovation (Nevens et al., 2012). The tools in Box 1 and 2 provide advice on setting up Labs, as well as initial exercises.

BOX 1 Policy Lab Handbook

What: This handbook helps you to set up and run a Lab that is aimed at aligning and innovating R&I policy for increased impact on the food system. It guides you through the phases of bringing together a diverse group of stakeholders, analysing the current food system and related R&I landscape, defining barriers and opportunities, and experimenting with new ways of conducting R&I.

How: The handbook is an overarching tool that provides examples, tips and tricks, and links to the various tools that could be useful along the way.

Who: Stakeholders at the national, regional, local, even the supranational policy level can use this tool. Ideally, a Policy Lab is coordinated by someone involved in policy development.

R&I policy alignment and innovation

R&I policy and programmes are fragmented within and among ministries and funding agencies and often only deal with one aspect of the food system and/or one segment of the knowledge chain. Achieving systemic change in such policy-making structures and impactful R&I policy alignment requires a process of participation, experimentation and discussion with a wide network of stakeholders. Key phases include: (1) building a diverse stakeholder network; (2) mapping and understanding the local food system, R&I programmes/policies and their synergies, as well as the knowledge needs of stakeholders; (3) co-developing future visions and potential pathways; (4) experimentation and innovation of potential improvements in processes and regulation (e.g. a transdisciplinary call for proposals or including a citizen panel) in practice; and lastly (5) reflection and evaluation of outcomes for successful legacy (FIT4FOOD2030, 2021). Tools related to these phases can be found on the Knowledge Hub. The tools in Box 3 and 4 help with identifying breakthrough areas and making steps towards change more concrete, helpful for phase 2 and 3, respectively.

Awareness-raising-oriented tools

Exploring and understanding the food system

Comprehensive understanding of how systems work is key to changing them. Questions such as: what is specific about the food/R&I system in a region or country?; how does this relate to the wider food/R&I system?; what is working well and should

BOX 2 Stakeholder Identification and Engagement

What: This tool offers a starting point for identifying who to engage and how to effectively get in touch with different stakeholders. The tool includes concrete exercises for identifying, empathising and understanding the perspectives of others, providing crucial support for facilitators hoping to create meaningful dialogue, engagement and collaborative actions.

How: It provides activities on desk research and relationship-building, such as conversation techniques. The tool provides brief, simple activities to support facilitators who are unfamiliar with stakeholder engagement and is thus also a resource for anticipating and addressing potential issues facilitators may face when seeking to bring different groups into shared activities.

Who: All facilitators engaged in food systems transformation.

BOX 4 Co-designing pathways for food systems transformation

What: This tool helps policymakers develop a range of innovative pathways, co-created by diverse stakeholders, to support the realisation of food systems transformation. Participants gain insights into the challenges and barriers in food systems, a range of options to support food systems transformation and a better understanding of how and what they can contribute towards various solutions.

How: Stakeholders design pathways by defining a goal and strategy, then mapping relevant steps towards realising their goal. Each step consists of policy instruments, relevant stakeholders and supporting trends.

Who: Suitable for stakeholders (e.g. civil servants, farmers, food company owners, food innovators, etc.) interested in food system transition and policies to support it.

BOX 3 Identifying Potential Breakthroughs

What: This tool helps stakeholders identify potential (R&I) breakthroughs which are necessary to achieve the envisioned future-proof food system and stimulate thinking about what is needed from R&I to support these breakthroughs.

How: Participants map breakthroughs they think are necessary to realise their vision and identify educational and/or policy needs to improve the R&I system. The set of breakthrough cards (<https://fit4food2030.eu/inventory-of-possible-ri-breakthroughs-in-food-systems/>) can be used to facilitate discussion and provide inspiration.

Who: Stakeholders (e.g. policymakers, researchers, business, funders, NGO/CSO etc.) interested in exploring breakthroughs needed to support change.

BOX 5 Trends in the Food System – The Card Game

What: This tool offers an interactive game based on work conducted on trends in food systems. It includes over 60 trends from a variety of sectors in and beyond food systems such as agricultural production, food processing, consumer trends, economy and retail.

How: The card game can be used as an ice-breaker for dialogue sessions to create meaningful engagement and collaboration. The game is linked to a report on the various trends, their drivers and further inspiration on how to use the trends in interactive settings.

Who: The accessible nature of the cards means that they can be used by most stakeholders interested in interactive activities to spark dialogue around food systems and related trends.

be promoted, what is not, and how is it connected?, help to develop this understanding. Analyses such as these should be a group process carried out within a stakeholder network, incorporating and utilising all views and knowledge, allowing for an encompassing overview of food/R&I systems and a common understanding. The tools in Box 5 and 6 provide ideas on how to analyse the food system.

Educating or training people for food systems transformation

Integrating inclusive R&I approaches to transform food systems calls for activities that educate, engage, and influence both present and future traditional R&I stakeholders (e.g. researchers, policymakers) and more non-traditional R&I stakeholders (e.g. civil society organisations, farmers). These stakeholders

BOX 6 Visioning

What: This tool offers a host of exercises and facilitation tips on developing written and visualised statements of long-term goals and strategic objectives related to food systems. This process can ultimately lead to recommendations and transformations in, for example, food systems R&I policies, priorities, strategies, behaviours, attitudes and education.

How: The visioning process is a participatory tool developed to create a sense of shared vision of the future. Through the process, different stakeholders are brought together to co-create a vision of a preferred future food system.

Who: Stakeholders (e.g. policymakers, researchers, business, funders, NGO/CSO etc.) who are interested in engaging in a visioning process.

BOX 7 Educational modules for food system transformation awareness-raising and capacity building

What: This tool provides an overview of 18 educational modules covering food systems understanding and action with hands-on activities on topics such as food waste, laboratory exercises in food chemistry and agenda setting for change. Facilitators can find easy-to-use activities they can implement in their own organisation or project, as well as inspiration for additional activities and pointers on how to plan, carry out and evaluate stakeholder activities.

How: Modules are classified according to topic types, target audience and size, and offer step-by-step guidelines on how to conduct activities and suggestions for how they can be adapted to different needs or target groups.

Who: Educators as well as science museums and centres.

require the right competencies and tools to 'do' food system transformation. In *FIT4FOOD2030*, these objectives were mainly pursued by City/Food Labs, where systematic visioning around desired food system futures with diverse audiences fosters transformative change through new competencies and actions. Central to these efforts is the need to balance engaging activities with substantial learning and meaningful participation, fostering first order learning about subject knowledge, as well as second order learning

BOX 8 Dynamic Learning Agenda (DLA)⁶

What: A DLA is a continuously updated agenda tracking relevant challenges, strategies and experiences, to make group dialogue productive and focussed on the aims and means of their activities. The DLA allows a project facilitator to maintain focus, plan actions and continuously strengthen a group's understanding of barriers to their shared project and improve their strategies for addressing them.

How: The DLA helps groups identify which aspects of challenges pertaining to complex processes are available to influence and worthy of attention and effort. It also gives pointers to transformation facilitators on how they can stimulate dialogue and develop shared understandings of underlying issues, thereby helping groups develop transformation strategies.

Who: DLAs can be used by facilitators of and participants in any transformation process.

which stimulates reflexive questioning of one's own place and assumptions within wider societal systems in need of change (van der Meij et al., 2017). The two tools in Box 7 and 8 provide ideas for educational modules and an agenda for helping facilitators 'do' food systems transformation.

SUSTAINABLE FOOD SYSTEMS NETWORK

In parallel to the *Tools for Transformation*, a continuation of the FOOD 2030 platform, called the *Sustainable Food Systems Network* (<https://sustainable-food-systems-network.mobilize.io/registrations/groups/42013>) is a vehicle for providing stakeholders interested in food systems transformation the opportunity to connect, collaborate and engage in online discussions, through a discussion board, promotion of events, opportunities, webinars and resources. Impactful communication and collaboration among a diversity of stakeholders at local, regional, EU level is a prerequisite for transforming food systems. In doing this, the network enables valuable cross-sharing of knowledge and resources, including amplifying outreach of the *FIT4FOOD2030* project outcomes to relevant audiences through the exhibition and stimulation of experimentation with the *Tools for Transformation*. In its first months, the network has reached 1000+ members. To become part of this growing and multi-disciplinary network of

⁶For an introduction to the conceptual background for and practical approaches to using DLA, see van Mierlo et al., (2010). For a practical approach developed specifically for FIT4FOOD2030, see Svare (2018).

food systems transformation change agents, visit the *FIT4FOOD2030* website (<https://fit4food2030.eu/the-sustainable-food-systems-network-goes-live/>) to join.

CONCLUSION

Research and Innovation could be a key driver in the transformation towards more sustainable food systems and thus represents a key strategic area in the Farm to Fork Strategy and EU Green Deal (De Froidmont-Goertz et al., 2020). Investing and contributing to the competency development and tools for R&I food systems stakeholders to 'do' food system transformation is vital for supporting this transformation. Responding to this gap, the *FIT4FOOD2030* project has provided tools to boost competencies among food systems stakeholders through the creation of the *FIT4FOOD2030 Knowledge Hub* and the growing *Sustainable Food Systems Network*. The project invites all readers whether they work with food-, health- or energy-related transformational processes to use, adapt and incorporate the *Tools for Transformation* to adopt more inclusive, transdisciplinary, and systemic approaches to the demanding challenges we face today.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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