



# Strategy for Removing Lock-ins and Developing Sustainable Food Value Chains

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D3.1: Strategy for Removing Lock-ins and Developing Sustainable Food Value Chains

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# 1. Introduction

This document describes the conceptual thinking and methodological approach for gathering targeted information that can form the basis for a strategy under the short title 'Food 2030 Unlock Strategy' (FUS) for removing lock-ins and developing sustainable food value chains. Parts of the methodology, namely the Focus Group meeting series with selected Living Labs from the Food 2030 network, are considered to find an extension in the later implementation of FUS by supporting future co-creation processes at the level of Living Labs and other food system innovation players that are considered to play a key role in overcoming barriers and lock-ins for food innovation from a social and technological perspective.

Our research builds upon preparatory work, such as ongoing recurring monthly WP3 discussions with CLEVERFOOD partners as part of the knowledge exchange process, insights gained from the CLEVERFOOD Food 2030 Conference 'Transformative Food System Innovation' (Brussels, March 5-7, 2024), a literature review and a consultation process involving other dedicated EU projects, such as FEAST, CITIES 2030, SISTERS, Foodshift Pathways, Data4Food 2030 as well as BEATLES, ENFASYS and VISIONARY. This exploration is meant to feed into a 'theoretical framework' for the strategy building upon expert contributions during the Focus Group sessions addressing different lock-in experienced by food system innovators operating in the field of social and/or technological innovation. Technological innovation is not possible without social innovation, so we aim to explore the interplay of technological and social innovation in the context of the food transition.

Hence, the role of 'lock-ins' (including the underlying aspects of 'barriers') will be examined in the context of initiatives dedicated to developing more sustainable value chains with special focus on boosting social and technological innovation. It is of utmost importance to understand the key characteristics of these endeavors with regards to the underlying business model/operational concept, its maturity (Technology/Innovation Readiness Levels, Social Readiness Levels - please details in Annex 3), policy and market environment, up-scaling perspectives, and observed barriers and lock-ins.

## 1.1. The Strategy Playfield

### 1.1.1. Sustainable Food Value Chains

The central subject of the Food 2030 Unlock Strategy (FUS) is the establishment of Sustainable Food Value Chains to overcome or reduce the substantial negative impacts on human health, the environment, animal welfare and climate of the current food system. As such, FUS builds closely upon the mission statement of the CLEVERFOOD project: to join forces across projects and initiatives, and to get stakeholders on board to support food system transformation for the benefit of both the people and the planet.

The strategy hence aims to facilitate a society-wide mobilisation by proposing a number of targeted measures and implementation targets for reducing barriers and removing lock-ins



that obstruct a full-fledged development of sustainable value chains as the backbone of the European food system.

According to FAO (2014), a sustainable food value chain is a food value chain that (see Figure 1):

- is profitable throughout all of its stages (economic sustainability);
- has broad-based benefits for society (social sustainability);
- has a positive or neutral impact on the natural environment (environmental sustainability)

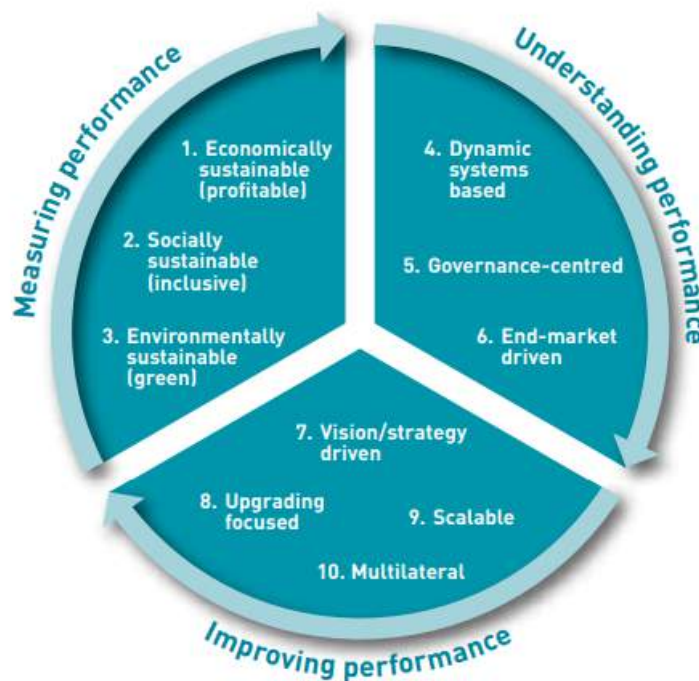


Figure 1: Principles of Sustainable Food Value Chain Development (FAO 2014)

According to the EU Food System Monitoring Dashboard released by the EC on November 29, 2024, the Food System Model builds on the components of the food supply chain, including Primary food production, food processing, distribution and consumption. The sustainability aspects (social, economic, environmental and horizontal) that are looked at and are to be operationalised in a Dashboard translate into 38 domains (see Figure 2).

From the CLEVERFOOD perspective, we would add that the above dimensions should be tied together by the principles of circular economy at the regional level (see also section 1.4). FAO's definition of sustainable food chains 'recognizes that food value chains are dynamic, market-driven systems in which vertical coordination (governance) is the central dimension and for which value added and sustainability are explicit, multidimensional performance measures, assessed at the aggregate level' (2014). For food chains to be sustainable in its broadest sense, it is evident that value is added in the economic, social and environmental domain. Linked to the UN's Sustainable Development Goals (UN, 2015), this means that economic growth goes hand in hand with social inclusion and environmental protection. These elements are interconnected and all are crucial for the well-being of people and the planet.

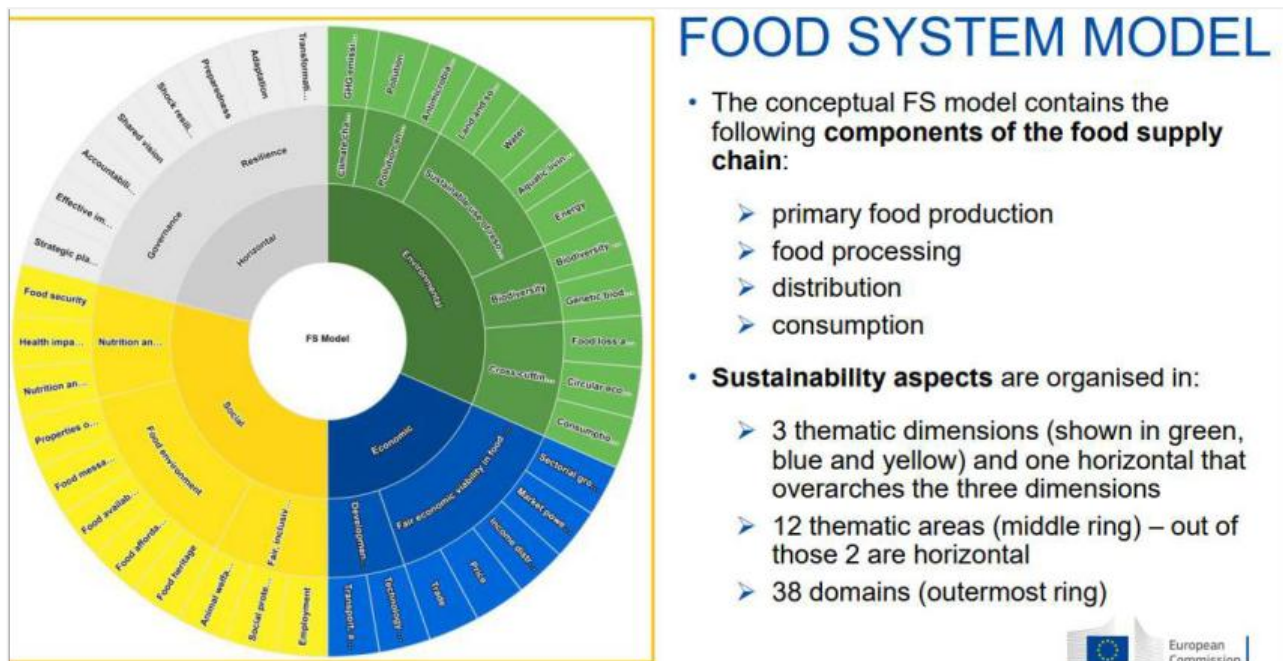


Figure 2: Food System Model and sustainability domains as envisaged in the [EU Food System Monitoring Dashboard](#). Source: EU Food System Monitoring Dashboard (EU, 2024)

The FUS will focus on social and technological innovations and the role Living Labs serve in tackling lock-ins and barriers when building sustainable food value chains. In order to achieve this, it is key to mobilize impact investors for funding support for food innovation actors (e.g. the Food 2030 Living Lab network), promoting the uptake of new and inclusive (data-driven) technologies and measuring food system transition progress through co-monitoring.

### 1.1.2. Social and technological innovation

With regard to the role of social and technological innovation within food system transitions, we need to understand how these different types of innovations interact and complement each other or challenge their underlying dichotomy regarding food innovation practices. In the following paragraphs, we highlight some aspects of the context.

End-users of social innovation and co-creation are citizens. The objective is hence to address societal challenges through an open innovation process between politicians and citizens. Rather than being connected to the mere production of new foods and services, this type of innovation is also connected to institutional innovation within the public sector and civil society (Voorberg et al., 2015; Torfing, 2019). Social innovation involves local society in response to social challenges with the of enhancing the impact on social wellbeing (Cattivelli, 2022). ‘Innovation’ in this sense does not merely refer to a technological improvement of an existing process, it is the originality with which the local population adopts bottom-up approaches to resolve local problems autonomously, while stimulating cultural change (Schafer & Kieslinger, 2016). As a vehicle for developing new solutions that address societal needs, this type of innovation has been trialled, especially in areas where local government-provided public services are inadequate.

While technological innovations focus on new products, processes, or technologies, social innovations emphasize new practices, relationships, and organizational models with the focus on social value creation. Social innovations in food systems are often intertwined with technological innovations, creating a synergistic effect that can drive systemic change ([Alijani & Wintjes, 2017](#)). An example of this is the use of Information and Communication Technologies (ICT) for the purpose of social innovation. Alijani and Wijnjtes, however, mention that the expansion of ICT innovations has had a twofold effect: technological innovations have accelerated the emergence and diffusion of new solutions to existing social problems on the one hand, while they have increased inequality among the marginalised population (e.g. the “digital divide” excluding people from the digital society). Hence, the co-evolution of technological and social innovation highlights the importance of policies in support of social innovators, innovation networks as well as technology and knowledge intensive inputs and outputs that support the positive interplay between technological and social innovation.

### Examples of Social-Technological Synergy

1. Alternative Food Network\*: Platforms like the REKO-network (Hagolani-Albov and Ehrnström-Fuentes, 2023) use social media technology to facilitate direct producer-consumer relationships, combining technological tools with social innovation in market structures.
2. Citizen Shareholder Companies (CSCs): These blend innovative financing models with sustainable agriculture practices, showcasing how social and technological innovations can work together.
3. Community-Supported Agriculture (CSA): CSA often utilize online platforms for coordination while fundamentally changing the social structure of food production and distribution.

#### 1.1.3. Transformative Potential

The combination of social and technological innovations has significant potential to drive food system transitions:

1. Holistic Approach: By addressing both technical and social aspects, these innovations can create more comprehensive and sustainable solutions that aim for social inclusion.
2. Knowledge Exchange: Social innovations facilitate learning processes and knowledge sparing, which can accelerate the adoption and adaptation of new technologies.
3. Systemic Change: The interplay between social and technological innovations can lead to more profound systemic changes, challenging existing paradigms in food production, distribution, and consumption.

In conclusion, while technological innovations provide new tools and methods, social innovations in food systems focus on reshaping relationships, practices, and organizational structures within the food system. The most effective transitions in food systems are likely to occur when these two types of innovations work in tandem, addressing both the technical and social challenges inherent in our current food systems.

## 1.2. The strategy approach

Navigating the complex landscape of existing policies and market mechanisms, the Food 2030 Unlock Strategy (FUS) aims to:

1. Build upon concrete cases and narratives out of the Food 2030 network
2. Target a multi-level approach that takes into account different geographic scales, jurisdictional responsibilities and stakeholder environments
3. Support specifically Living Labs, transition managers and other food innovators from the Food 2030 Network with creating bigger impact through their food innovation activities
4. Strengthen evidence-based activities of these food actors to improve the Science-Policy-Interface
5. Put forward implementation targets that allow co-monitoring over time in collaboration with the Food 2030 network food innovators
6. Deliver tangible, measurable results instead of broad, generic objectives
7. Complement, not complicate, current frameworks

The strategy will be judged by its added value for innovators, engaged living labs, research and educational services, investment and policy partners, citizens, and social/public media. It is not meant as a blueprint for another EU policy framework or a comprehensive document for all aspects of food system transformation. In fact, the fate of the Farm to Fork Strategy and the abandonment of its flagship initiative the “legal framework for sustainable food systems” as well as the recent [withdrawal of the EU's Sustainable Use Regulation](#) to cut down pesticide use in agriculture by 50% until 2030 makes clear, that legal measures in support of an EU-wide transition to a more healthy and sustainable food system are very much out of reach. Instead of new legislative proposals, the future [Commissioner Christophe Hansen](#) considers “better implementing and enforcing existing legislation while using incentives and new market-based tools” as the way forward.

### 1.2.1. The Strategy Building Blocks

Instead, the Food 2030 Unlock Strategy (FUS) will put forward concrete mechanisms for innovation and data-driven approaches towards sustainable food chains identifying a set of key principles that mark lock-in and barriers in food systems, establish a strategy framework with a series of drivers of positive change and action fields, propose a collaborative effort for implementation by reaching out to the society at large and launch a multi-actor monitoring system at the micro, meso and macro-level (see Table 1 and Section 2.3). Figure 3 shows the sequence of five building blocks towards the strategy.



Figure 3: Building Blocks of FUS

The FUS Strategy Building Blocks (Figure 3) have served as a first outline when communicating the expected content of the strategy and served as a guiding principle for

its development. In the following sections, we will briefly explain the role of each building block and how it comes back in this document.

### 1.2.2. The Strategy Roadmap

Figure 4 shows the path to the FUS, which involves an ongoing collaborative process within CLEVERFOOD and beyond it, with external partners, featuring a series of ten focus groups (FG) and several co-creation sessions. The figure illustrates that the Strategy Roadmap draws - next to a literature review - strongly on the results of Focus Group meetings with different types of food system change approaches. During all of these FG meetings, we pay special attention to the role of technological and social innovation. The results of these meetings are summarized in synopsis documents highlighting both lock-ins and barriers for each case, potential solutions, as well as in full transcripts (see Annex 2).

The approach is based on two phases: (1) the concept and draft development, and the (2) implementation framework. Though we dedicated a number of online and in-person sessions to the co-creation of the strategy, the Focus Group meetings themselves have actually taken this role as well since participants co-defined the nature of barriers and lock-ins.

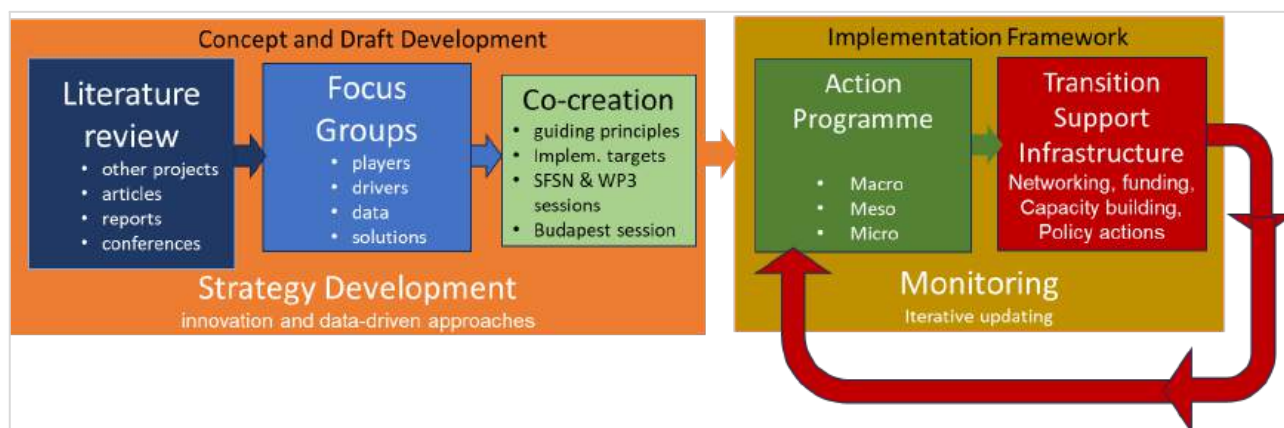


Figure 4: The Strategy Roadmap

The remaining chapters of this deliverable are structured as follows. Next chapter presents the literature review upon which the FUS relies as well as the conceptual approach proposed and implemented in the FUS process. Chapter 3 provides details on the series of FG meetings, its outcomes and analysis. Chapter 4 describes the FUS implementation framework and its connections to the theory of change. Chapter 5 lists and describes the FUS strategy actions and corresponding implementation pathways. Chapter 6 ends this deliverable by providing the main conclusions of this FUS-centered work.

## 2. Literature review and conceptual approach

### 2.1. Literature review

In the context of food innovation, transformative change is based on co-creating socio-cultural, economic and political environments in which food innovators are enabled to disrupt incumbent regimes where lock-in mechanisms and barriers are reinforced and strengthened ([Blesh et al. 2023](#); [Rutting et al. 2022](#)). In the following sections, we will highlight some aspects of transformation and co-creation in their juxtaposition towards the notion of barriers and lock-ins.

#### 2.1.1. Transformation and co-creation

The concept of ‘co-creation’ originates from business theory and is used to analyze the diversity and complexity of possible cooperation mechanisms for sustainable food system change ([Galvagno and Dalli, 2014](#)). In the context of research done in the [FoodPaths project](#), this form of co-creation partnerships is considered a joint and collaborative process of producing new value within food systems where the interaction between the economic, socio-cultural, political and environmental domain is key for food innovation ([De Vries et al. 2024](#)).

Hence, there exists an inter-connectedness between these different societal domains, pointing to the need of adopting a multidimensional, interdisciplinary and systemic approach for better understanding and addressing both the positive and negative dynamics behind sustainable food system change. It is exactly within the interaction of these domains that reinforces both lock-ins and barriers, while also positive drivers, for food system change. This holistic understanding is a prerequisite for fostering transition towards sustainable food innovation ([Moscatelli et al. 2016](#)).

Furthermore, based on the complexity and diversity of the agri-food-system, it is important to point out that these enabling environments differ geographically (Coenen et al. 2012; Lamine and Marsden 2023), due to socio-political history and other regional factors, implying that fostering transformation requires context- and scale-specific strategies ([Bennett et al. 2021](#); [Vermunt et al. 2020](#)).

#### 2.1.2. Lock-ins and barriers

As the literature on barriers and lock-ins is rather comprehensive, we decided to give priority to similar efforts undertaken in parallel by other Horizon research projects such as ENFASYS and to present a selection of relevant references in Annex 1 to this deliverable. Referring to studies undertaken by Arthur (1988, 1989), Klitkou et al. (2015) addressed the role of increasing returns of adoption, positive feedbacks and path dependency leading up to lock-in situations - in essence the underlying success stories - as well as on the role of events, but also of coincidence that allow economies of scale and help decreasing cost

conditions (David, 1985). These increasing returns can also cause economies to become locked into an inferior development pathway, which is difficult to escape.

We hence define a lock-in as a self-reinforcing and stable mechanism that maintains the dominance of a certain technology, practice, or system over time, making it difficult to transition to more sustainable alternatives. While the term "lock-in" may not be explicitly mentioned in all the papers, they discuss related concepts and barriers that contribute to the understanding of lock-ins in the context of sustainability transitions.

According to different sources and own observations, mechanisms that hinder or pose challenges for the transformation towards SFS are not always of systemic nature but must be considered to have a variety of underlying processes and origins. In fact, considering all obstacles and hindrances as systemic is likely to decrease the action space of those stakeholders that engage in the transition as practical solutions and measures that are in reach, might easily be discarded. This also means that there are not simply systemic and non-systemic mechanisms, but a large variety and hybrid forms of these two extremes. In this context, Machteld et al. (2022) make references to various authors who consider 'path-dependency' as being closely related to the phenomenon of lock-ins. According to these authors path-dependency holds that the current configuration is "a consequence of the process' or system's own history" (Martin and Sunley, 2006). In the case of the food system, this is true for the institutional development in both academic and policy related history as the topic of 'food' has only emerged rather recently as an item of concern and relevance of the different agendas, programmes and mindsets. At the beginning of this millennium sectors like agriculture, environment, food safety, health, and climate change became less monolithic in terms of separate areas of expertise and governance. Instead, there was a growing recognition of the need for a holistic, integrated approach that emphasizes the interconnected mechanisms within what we now call "the food system." Though this view is in principle in the process of becoming mainstream, our institutional, structural and organisational set-up is still rooted in sectoral divisions. While this can indeed be described as 'path-dependency', we will – for the purpose of practical considerations – address the above phenomenon as lock-ins.

Differences between mechanisms in food system transition are important to acknowledge and here we considered the notion of 'shallow lock-ins' (Machteld et al. 2022) as a valuable concept to be further explored. An example of a shallow lock in is food packaging, where Machteld et al. (2022) acknowledge that "greater change is created by pushing on the deeper system properties, such as the rules or the paradigms that shape the system, in comparison to shallower properties such as material flows or reward structures" (Leventon et al., 2021). Because of the specific nature of shallow lock-ins, we call these 'barriers' and propose a different set of solution pathways than what we consider (systemic) lock-ins.

Based on the literature review and input during the focus group sessions (see section 3) we identified barriers and lock-ins at the micro-, meso- and macro-level of the food system (see Box I) below.

### BOX I: Definitions

#### Lock-ins (macro-level systemic forces):

Deep-rooted conditions that maintain the current linear system, like investments in large-scale farming, poverty or dependency in energy prices.

These are hard to change because they reinforce each other and keep the dominant system in place.

#### Barriers (meso- and micro-level obstacles):

Specific obstacles that block progress, such as lack of funding for small farmers, regulations or public perception. These can eventually be removed with targeted actions.

#### Positive synergy:

removing many barriers may also positively affect lock-ins..

#### In short:

lock-ins require a high-level system approach, while barriers can be tackled at lower, sub-system levels, e.g. by targeted funding or policy measures, social and technological innovation, communication, training and education or a combination of the above. Systematically removing barriers may also affect lock-ins at the system level in the long term.

In other words, unlocking the mechanisms that reinforce deep socio-technical system properties will have more potential to initiate sustainability transitions than interventions that target shallow properties. As such, we understand shallow lock-ins as mechanisms reinforcing “modifiable, mechanistic characteristics” or “physical elements of a system”. According to this approach, deep lock-ins refer to mechanisms reinforcing “the structure of information flows, rules, power” as well as “norms, values, and goals embodied within the system” (Abson et al., 2017).

For a more detailed review of recent literature on barriers and lock-ins, see Annex 1.

## 2.2. Conceptual approach

The above literature review as well as own insights from various Food 2030 projects over the last years point at a large variety of food system transition pathways. Examples are creating healthier products, forming new partnerships and innovative business plans, or redefining the role of governance - including new citizen-driven approaches. These approaches are facing:

1. A policy-business infrastructure rooted in the linear economy
2. A focus on economic advantages over social and environmental benefits
3. Short-term project funding conflicting with long-term sustainability goals
4. A one-directional Science-Policy-Interface
5. Difficulties to present coherent and convincing narratives on the transition
6. Fragmentation and access-problems of key food system data

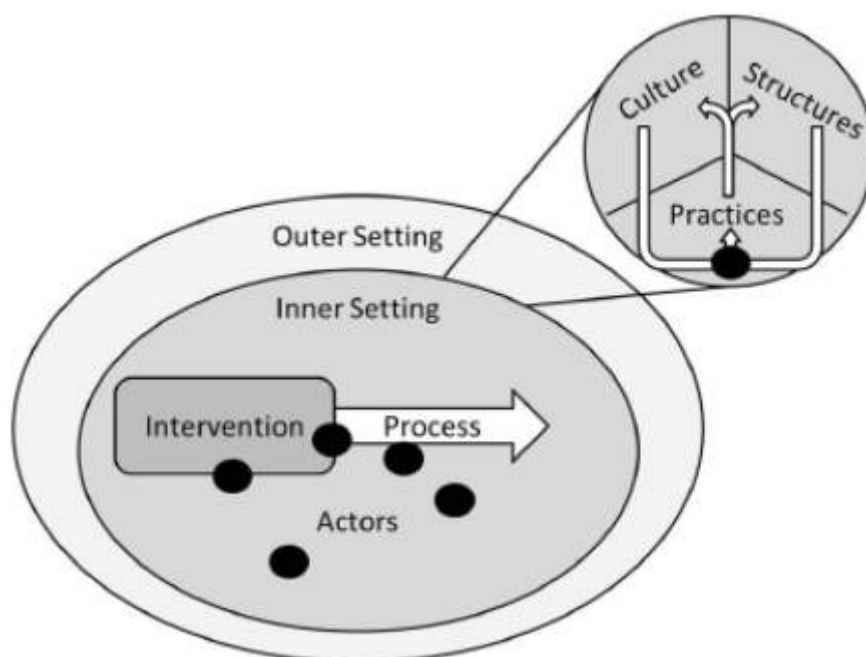


Figure 5: Consolidated Theoretical Framework for Implementation Research by Middel et al (2019) addressing inner and out settings.

Drawing on a systematic review of a system innovation perspectives undertaken by Middel et al. (2019), its consolidated theoretical framework (see Figure 5) and the results of the Focus Group implementation, we identified the following string of key issues including some examples from the focus groups:

1. **Technical & practical processes** (this can include problems such as lack of technical solutions as well as processes related to the food chain or climate/soil restrictions)
2. **Digitalisation & data** (here we address mainly data format, access and standardisation issues)
3. **Tacit & expert knowledge** (knowledge of stakeholders, citizens, experts as well as policy makers - as well as all school and education related knowledge issues)
4. **Socio-cultural perspectives** (addressing preferences, choices, mental barriers and values, traditions and emotional settings)
5. **Policy & institutions** (all governance issues at different levels of scale as well as the institutional inertia and structures)
6. **Economy & markets** (related to business plans for profit, funding issues, wider national and global market dynamics, resource prices, fair pricing)

The focus group meetings made clear that the perception of what constitutes a barrier versus a lock-in can differ between stakeholders and focus groups. An example is political resistance against more plant-based food. If this occurs at the level of a municipality - eventually from certain political parties - it could be considered both a barrier (because it might be possible to find a way of convincing these politicians) or as a lock-in if the political blocks have not changed their position since many years. In these cases, we accepted the perception of the Living Lab exposed to such a resistance as the guiding factor (see also section 3.1.4.).

Drawing from the aforementioned list of key issues, Figure 6 provides an initial overview on some of the most prominent factors behind lock-ins and barriers and their connections. Again we refer to the literature review addressing barriers and lock-ins in Annex I.

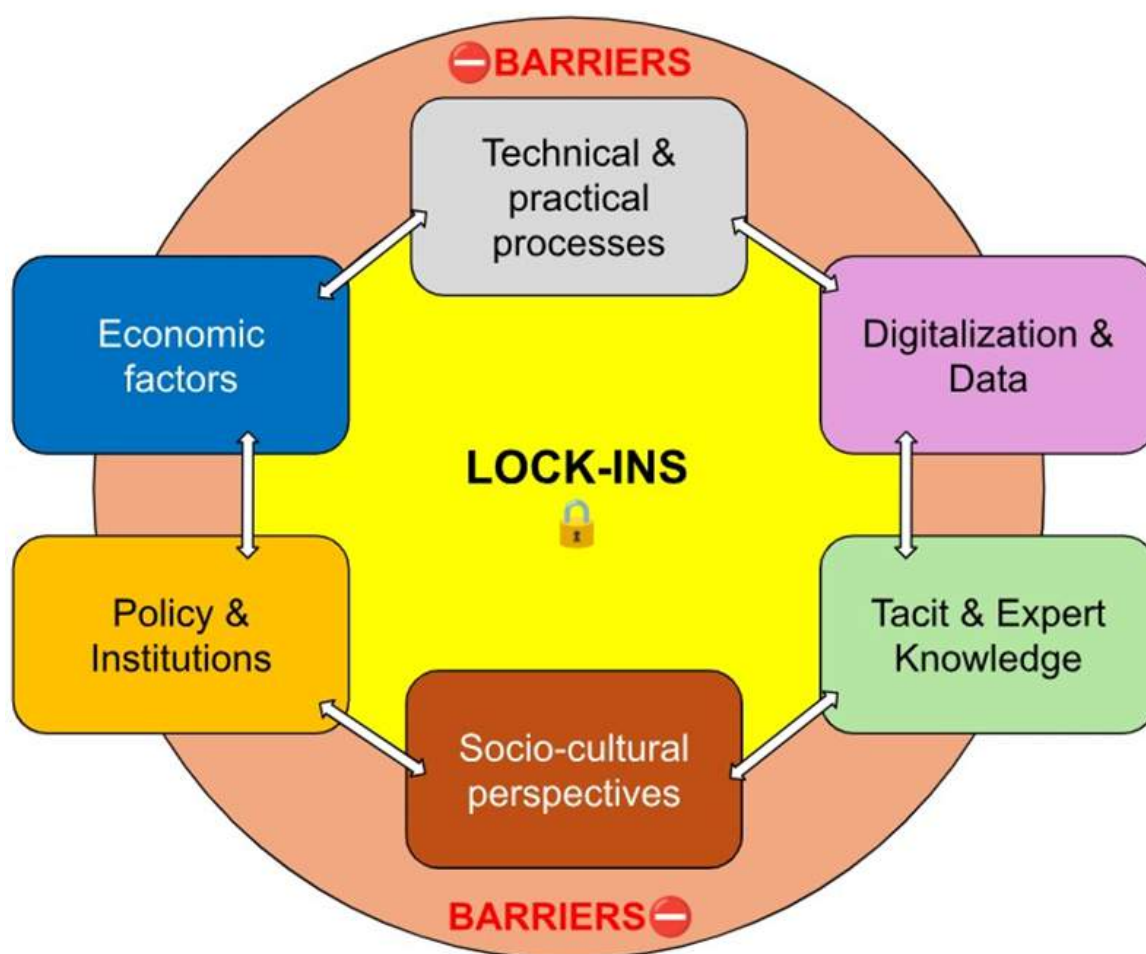


Figure 6: Key factors posing barriers and lock-ins for a transition towards sustainable agri-food systems (from Wascher, Arciniegas, Jovanovic, 2024).

## 2.3. The macro-, meso and micro level

FUS proposes to establish a Transition Support Infrastructure (TSI) at the macro-, meso- and micro-level of the food system. While Living Labs are considered as key targets - and we define living labs in their widest possible sense - the envisioned support infrastructure is meant to be applicable for all relevant stakeholder initiatives engaged in sustainable food system transitioning. Based on the results of the Focus Group sessions and literature review, the envisioned TSI is meant to provide useful orientation towards building the implementation framework.

Table 1: Food system characteristics at the macro-, meso and micro-level

| <b>Macro</b><br><br><b>Global, international, national</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Meso</b><br><br><b>(city-)region, inter-region, metropolitan</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Micro</b><br><br><b>Local / urban / sub-urban</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The Macro-level typically addresses systemic lock-ins that are the result of historic, institutional, economic or cultural forces associated with the existing linear food system. While this applies conceptually to the top-layer of the food system (global trade, international policies and economic constraints) there is also a spatial-functional dimension of large-scale, export-driven and industrial agriculture. The latter is frequently interwoven with meso-level land use/hybrid formats. Precision agriculture, circular economy and food labeling can be considered as typical topics linked to macro-level policy instruments.</p> | <p>Functionally and spatially located at the metropolitan fringe of urban areas – a space that by definition is offering opportunities on a regional level for multi-functional services such as recreation, nature and cultural landscape, city-bound fresh food production, food processing and food chain innovation as well as for closing loops between resource streams. This City Region Food System ('foodshed') is key to regional food security and urban-rural relationships and multi-functionality – offering opportunities for overcoming system lock-ins at larger scale.</p> | <p>As the trend towards increasing urbanization continues to expand our cities and urban agglomerations, a variety of urban agriculture (UA) has become a trademark of food system innovation that is driven locally by citizens, start-up business developers as well as policy makers in charge of urban food policies in support of innovative ways to produce, process and consume food. While its share of the overall food system is still modest, it has become a driver for lifestyle, city branding and innovation.</p> |

Living Labs are places for open innovation where co-creation is a method for addressing real-life issues. They are physical or virtual spaces where societal challenges, especially in urban areas, are solved by bringing together various stakeholders for collaboration and collective ideation ([Massari and Mattioni 2023](#)).

The importance of Living Labs and their role in co-creation is clear from the increase in the use of this term in EU projects related to food within the CleverFood 2030 network (see projects such as Food Shift2030 and Fit4Food [Hossain, Leminien & Westerlund, 2019](#)). Hence, Living Labs have the potential to play an evident role in offering a space for both social and technological innovation and to overcome barriers and lock-ins for food system change. The role of Living Labs and LL-related organizations from the Food 2030 network will be explored in the following section (see Chapter 3).

According to the literature review and focus group meetings we found that the spatial-functional spectrum of metropolitan food systems or Food City Regions is strongly associated with the so-called 'meso space' between the micro level food systems (urban agriculture within the city) and the macro-level food systems (mainstream large-scale, export-oriented production agriculture). The barriers for allowing these potentials to materialize can be seen in the fragmented (not integrated) nature of current policy structures, a food business sector which prioritizes the global mainstream (macro-level)

and consumers whose choice for low price food products are ultimately driving the concurring food systems.

## 2.4. Examples of interventions and implementation targets

In the following sections we list some implementation targets and other interventions that will help strengthen the transition support infrastructure food stakeholder on the macro-, meso and micro level.

(I) Interventions and implementation targets to tackle socio-economic & political lock-ins at the macro level

- Lobby at the European Level (Parliament, Europe of the Regions, European School Education Platform) for the inclusion of Sustainable Food Teaching or food literacy into national curricula;
- Target at Rural Development Fund, LEADER Programmes and Regional Cohesion to address links between city and rural areas via sustainable food chains;
- Use similar channels for addressing poverty issues and financial support for vulnerable groups for accessing healthy and organic food

(II) Interventions and implementation targets to tackle cultural & social lock-ins at the meso level

- Organize regional events fostering co-creation processes between urban and rural stakeholders along sustainable food chains;
- Launch information campaigns via social media, tv and events (including exhibitions and large-scale youth events) to inform about the effects of food consumption on landscapes and biodiversity in the region (e.g. ecological footprint days);
- Targeted interventions for different population segments (e.g. in terms of age group, education, cultural background) to promote healthy food that is inclusive and accessible for all.

(III) Interventions and implementation targets to tackle barriers at the micro, often urban & physical stakeholder level

- Create more evidence when dealing with stakeholders > data transparency, regional relevance and easily understandable;
- Avoid technical, policy and academic jargon, integrate into existing social structures, aim at a high level of identification, take a playful/gaming approach to food system change;
- Organize information events as part of other social gatherings, celebrate food heroes, use large scale advertisement for food innovation;
- Bring together unusual stakeholders, be ahead of the discussion and societal debate, offer rewards and incentives, be critical about comfort zones in daily procedures, and think out-of-the-box.

Based on these implementations targets and bearing in mind the guiding principles for a Sustainable Food System, we propose a theoretical framework that is hinged upon three scale levels, namely the macro, meso and micro level.

## 3. Focus Group Assessment

As part of the FUS development, we chose to organize a series of Focus Group meetings to arrive at context-based insight views from living labs, researchers, practitioners and experts from different fields around food system transition regarding the role of barriers and lock-ins. Below we describe the approach we followed to set up, organize and hold the FG meetings.

### 3.1 Approach

#### 3.1.1. Selection and recruitment of Focus Group candidate hosts

- Consultation process with WP3 and WP4 partners and Cleverfood consortium partners involved in ongoing projects that feature lock-ins or barriers with diverse focus themes in food system transformation.
- Screening of Living Labs that joined the Food 2030 connected living lab network.
- Screening of projects that joined the Food 2030 project collaboration network.
- Liaison with selected partners, project and living lab representatives looking to co-organize and host a focus group meeting
- Final selection of a series of focus groups with a range of focus themes that cover the categories presented in Figure 5.

#### 3.1.2. Focus Group set-up

- A FG meeting is organized as an interactive discussion (1.5 - 2 hours), entailing between 5-7 participants at a time.
- FG Lead - mostly from CLEVERFOOD partnership but also other projects - is contacted by SusMetro and asked to organise the meeting.
- Participants (partners, researchers, experts and stakeholders identified by the FG Lead) develop their positions about lock-ins and barriers that hamper a specific food value chain.
- Guided by a moderator who sets topics and challenges for participants to delve into.

#### 3.1.3. Goals of Focus Groups

- Gather targeted information on typical lock-ins/barriers in sustainable food value chains,
- Establish the 'theoretical framework' for the envisioned strategy ('the building blocks'), and
- Initiate a co-creation process in which the strategy is finalized, tested and validated with stakeholders and project partners by means of defining and establishing theme-based implementation targets for each major lock-in/barrier at macro, meso, and micro level.

#### 3.1.4. FG step-wise organization process

- Preparation: Susmetro contacts a potential FG host candidate



- FG candidate to send proposal for a lock-in case it is experiencing with title and short description
- Planning of an online preparatory meeting with Susmetro to commonly frame the 'playfield' of the case and define the FG meeting agenda
- Identify time, place (online, live or both/hybrid), participants and roles (e.g. moderation, note-taking, presentation) for actual session
- Focus Group common agenda
  - Susmetro briefly presents the main building blocks of the FUS strategy's theoretical Framework
  - Discussion of three questions about (1) the understanding/agreement on the building blocks, (2) identifying the most crucial/vulnerable aspect of the value chain when it comes to lock-in and barriers of your food chain/innovation example, and (3) gathering proposals for removing the latter with special attention to digital and data technologies, and social innovation.
  - Feedback on composition of stakeholders and relevant issues in the further co-creation and implementation process

When implementing FG Meetings we have put strong emphasis on detecting as well as discerning between barriers and lock-ins to make sure we gain sufficient insights on the operational opportunities regarding the role of actors. We rely on the definitions and differences of lock-ins and barriers researched and presented in our conceptual approach (Section 2). We also made an effort to describe the results of the FG Meetings by means of concise and compact summaries to be reviewed by the participants. The aim was to arrive at rather pointed statements and observations instead of generic or extensive documents. We however keep detailed transcripts of all meetings (see Annex 2). In practice, being in the networking space, our interactions with FG contributors took place also after the dedicated FG meetings. Such interactions resulted in contributions that we chose to present in Annex 2, 3 and 5.

### 3.2. Implementation history

We conducted ten FG meetings in 2024 as indicated in the timeline presented in Table 2. Locations of FG host cities are shown in Figure 7.

Table 2: Timeline of focus group meetings and focus themes

| <b>Date</b>    | <b>Host organization and host city</b>                                    | <b>Focus theme</b>                                                                       | <b>Modus</b>                   |
|----------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------|
| July 6th       | Ellinogermaniki Agogi (EA)<br><b>Marathon (GR)</b>                        | Education and food                                                                       | In person                      |
| July 9th       | Wageningen Research<br><b>Wageningen (NL)</b>                             | Technology and data-driven lock-ins                                                      | In person                      |
| July 12th      | IrsiCaixa (IRSI),<br><b>Barcelona (ES)</b>                                | Citizen participation and technology lock-ins                                            | Online on Zoom                 |
| September 20th | SEGES (SEGES) Innovation<br><b>Aarhus (DK)</b>                            | Farm to Fork for greener meals                                                           | Online on Zoom                 |
| October 10th   | FEAST Ghent Living Lab<br><b>Porto (PT)</b>                               | Local food policy implementation (health)                                                | Hybrid (in person and on Zoom) |
| October 10th   | FEAST Cork Living Lab,<br><b>Porto (PT)</b>                               | Local food policy implementation (health)                                                | Hybrid (in person and on Zoom) |
| October 11th   | Institute of Agricultural Economics (AKI)<br><b>Budapest (HU)</b>         | Innovative crop production on marginal land for biomass production in a circular economy | Online on Zoom                 |
| October 17th   | City of Ostend<br><b>Ostend (BE)</b>                                      | Agropark lock-ins                                                                        | In person                      |
| October 22th   | Hungarian Research Inst. f. Organic Farming (ÖMKI)<br><b>Tardona (HU)</b> | Digital monitoring tools for extensive free-ranging livestock farming                    | Online on Zoom                 |
| November 26th  | FER Foundation<br><b>Krzyzowa (PL)</b>                                    | Greener meal planning with local, seasonal foods for youth centers and Canteens          | In person                      |



Figure 7: Geographic distribution of focus group themes and host cities

The above mentioned series of FG meetings as well as discussion with projects such as FEAST, FoodSHIFT Pathways, CITIES 2030, SISTERS, Data4Food 2030, Foodshift Pathways and BEATLES, EMPHASIS and VISIONARY led to an advanced draft version of the FUS. Results have been disseminated and discussed in co-creation workshops online (SFSN and WP3) as well in person during the CLEVERFOOD Consortium meeting in Budapest on December 3-4, 2024.

### 3.3. FG results

In the context of the Focus Group discussions and drawing insights upon concrete cases and narratives out of the Food 2030 network, six main themes (also presented in Section 2: Conceptual approach) have been identified (see figure 5) that might act as barriers (as well as lock-ins) that hinder social and technological innovation for sustainable food system change:

1. Economic factors
2. Socio-cultural perspectives
3. Policy & institutions
4. Digitalisation & Data
5. Tacit & Expert Knowledge
6. Technical & practical processes

This complex and sometimes simultaneous nature of above domains point to the need of examining the relationships between the barriers that influence the operational and organizational efficiency of the agri-food Living Labs and food innovators connected to the Food 2030 network.

The barriers are classified as main themes, where several sub themes have been identified which complement the further classification of the barriers experienced by the agri-food Living Labs and food innovators that have participated in the Focus Group discussions. A cross-comparison of the results across all FGs is offered in Annex 2, along with a categorization of specific lock-ins and detailed barriers.

Table 3 shows an overview matrix listing FG meetings held, along with the main focus theme and case study discussed and assessed, and the amount of lock-ins and barriers gathered in each FG meeting. The type of lock-in is indicated using a color scheme: the last six columns are color-coded following the color scheme of lock-in themes, while barriers are colored in pink, as presented in Figure 5. For example, the first entry (row) in the table, FG 1 'FS Pathways', Case 1 'Knowledge & Consumer Choice', featured 2 lock-ins (Socio-cultural and Policy & institutions, color-coded accordingly in blue and light orange) and 2 barriers (Policy & institutions and Technical & practical processes, colored in pink but place on the corresponding lock-in theme column). The background of the cell containing the entry is color-coded using the said scheme.

A close inspection on the general inventory of lock-ins and barriers across all FGs reveals interesting insights. Of all focus themes, Policy & Institutions lock-ins are the most present or discussed, across all focus groups, with FG4 AKI showing the largest amount of this type of lock-ins. Economic lock-ins are the second most dominant for all FGs, with FG8 ÖMKI (Hungary - Digital technology innovation in grazed beef cattle farming) gathering the most lock-ins of this type. As for barriers, Socio-cultural barriers appear most often across all FGs, followed by barriers related to Technical & practical processes. Two categories of lock-ins, Digitalization & data and Tacit & expert knowledge' were the least present or discussed. Digitization & data barriers were the least present across all FGs.

As far as the amount of lock-ins and barriers identified and collected through all focus groups, FG4 AKI (Hungary - focus theme innovation & biomass and innovative crops for a circular economy) reported the largest amount of lock-ins and barriers identified and discussed, followed by FG8 ÖMKI (Hungary - Hungary - Digital technology innovation in grazed beef cattle farming) and FG5 SEGES (Denmark - Focus theme More Danish Legumes on the Plate).

To summarize, this overview matrix shows that the most dominant lock-ins across this series of FG meetings were driven by economic, socio-cultural and policy & institutional factors, while the most dominant barriers were connected to socio-cultural factors, technical processes, and tacit & expert knowledge limitations. Obstacles related to digitalization & data and tacit & expert knowledge were the least reported as lock-ins. A full cross-comparison between focus themes and FG case studies is provided in Annex 2.

Table 3: Overview matrix of Barriers and Lock-ins identified along the three impact levels (macro-, meso-, micro-) in 10 Focus Groups.

| FOCUS GROUP            | THEME                              | CASE STUDY                                                                                  | Econ. | Socio-cult. | Policy & Inst. | Digitaliz & Data | Tacit & Expert K. | Tech & process |
|------------------------|------------------------------------|---------------------------------------------------------------------------------------------|-------|-------------|----------------|------------------|-------------------|----------------|
| FG 1<br>FS Pathways    | Educational innovation             | Knowledge & Consumer Choice<br>(macro)                                                      |       | 1L          | 1L             |                  |                   | 1B             |
|                        |                                    |                                                                                             |       | 1B          |                |                  |                   |                |
|                        |                                    | Food Adverts<br>(macro)                                                                     | 1B    | 1L          |                | 1L               |                   |                |
|                        |                                    |                                                                                             |       | 1B          |                |                  |                   |                |
|                        |                                    | Agricultural Land use change<br>(meso)                                                      |       |             | 2L             |                  | 1L                | 1L             |
|                        |                                    |                                                                                             |       |             |                |                  | 2B                |                |
|                        |                                    | Food Teaching<br>(meso)                                                                     | 1L    | 1L          | 2L             |                  |                   |                |
|                        |                                    |                                                                                             |       | 1B          |                |                  | 1B                |                |
| FG 2<br>WUR (NL)       | Data-driven innovation             | Eco-labeling<br>(macro)                                                                     |       | 1L          | 1L             |                  |                   |                |
|                        |                                    |                                                                                             |       | 1B          |                |                  | 1B                |                |
|                        |                                    | Perform Assess Systems<br>(macro)                                                           |       | 1L          | 2L             | 1L               |                   | 1B             |
|                        |                                    |                                                                                             |       | 1B          |                |                  |                   |                |
| FG 3<br>IrsiCaixa (ES) | Citizen Participation technologies | Web-based platform to promote healthy & sust. food<br>(micro)                               | 1L    | 1L          |                | 1L               |                   |                |
|                        |                                    |                                                                                             |       |             |                | 1B               | 1B                |                |
| FG 4<br>AKI (HU)       | Innovation & biomass               | Innovat crop prod. in marginal areas for biomass production in a circular economy<br>(meso) | 2L    | 2L          | 4L             |                  |                   | 2L             |
|                        |                                    |                                                                                             | 1B    | 1B          |                | 1B               | 3B                | 3B             |
| FG 5<br>SEGES (DK)     | Greener meals                      | Nuts with Danish Roots<br>(macro)                                                           | 2L    |             |                |                  | 1L                | 1L             |
|                        |                                    |                                                                                             |       | 1B          |                |                  | 1B                | 1B             |
|                        |                                    | More Danish Legumes on the Plate<br>(macro)                                                 | 2L    | 2L          |                |                  | 1B                | 3B             |
|                        |                                    |                                                                                             |       | 2B          |                |                  |                   |                |
| FG 6<br>Cork (IR)      | Role of LL as change makers        | Common Language for Healthy & Sustainable Food<br>(meso)                                    | 1L    | 2L          | 1L             |                  |                   |                |
|                        |                                    |                                                                                             |       |             | 1B             |                  |                   |                |
| FG 7<br>Brussels (BE)  | Role of LL as change makers        | Healthier and more sustainable food services<br>(meso)                                      |       |             | 3L             |                  | 1L                |                |
|                        |                                    |                                                                                             |       |             | 2B             |                  |                   |                |
| FG 8<br>ÖMKI (HU)      | Digital monitoring                 | Digital technology innovation in grazed beef cattle farming                                 | 3L    | 2L          | 1L             | 2L               |                   |                |
|                        |                                    |                                                                                             | 1B    | 2B          |                | 1B               |                   |                |
| FG 9<br>Ostend (BE)    | Agro-park lock-ins                 | Case: Agro-park<br>(meso)                                                                   | 2L    | 1L          | 1L             |                  |                   | 1L             |
|                        |                                    |                                                                                             |       | 1B          |                |                  |                   | 2B             |
| FG 10<br>Krzyżowa (PL) | Greener meals in canteens          | Green Canteen in youth center<br>(micro)                                                    | 2L    | 2L          |                |                  | 2L                | 2L             |
|                        |                                    |                                                                                             |       | 2B          |                |                  | 1B                |                |
| TOTAL lock-ins         |                                    |                                                                                             | 17L   | 16L         | 18L            | 5L               | 5L                | 7L             |
| TOTAL barriers         |                                    |                                                                                             | 3B    | 12B         | 5B             | 3B               | 11B               | 12B            |

## 4. Theory of Change and implementation framework

While the vision of the Cleverfood FUS Strategy is largely rooted in the FAO approach (see Section 1.1), the FG approach helped us to redefine a Theory of Change for food system transition and to formulate guiding principles for directing strategy actions.

During the Cleverfood consortium meeting in Budapest (3-4 December, 2024), SUSMETRO facilitated a co-creative feedback session on the current status of the FUS strategy on overcoming lock-ins and barriers for food system change. The Theory of Change has been mentioned by a consortium partner as a desirable reference to highlight the connections and synergies across the micro, meso and macro impact levels and help draft strategic action points within and across the different levels.

### 4.1. Theory of Change under the Strategy

A Theory of Change (ToC) is an evaluation method that is usually done at the beginning or during a project to inform or improve the planning and/or design of a project. Such process-based evaluation can help identify strengths and weaknesses of a project and identify action points to overcome these challenges (Schaefer et.al., 2021). Section 1.1 puts forward the need to explicitly address ‘circular economy’ as one of the underlying principles of Sustainable Food Systems and is considered to be an essential focus topic for implementing a ToC for the FUS strategy (see Figure 8). This way, it should be ensured that food waste is being reduced, that agricultural rest streams are being mainly used for serving food end use products and that other non-food-fit agricultural rest streams are not disposed or burned, but serve functions along the bio-based economy concept, such as [using food waste as bio-based building materials](#).

Another aspect is the role of city regions when describing the operational space of the strategy. Here we consider the definition by Tefft et al (2017) as a guiding principle:

*A city-region food system is a concept that refers to a complex network of actors, processes and relationships related to food production, processing, marketing and consumption that exist in a given geographical region and includes a more or less concentrated urban centre and its surrounding peri-urban and rural hinterland – a regional landscape across which flows of people, goods and ecosystem services are managed (Tefft et al., 2017).*

The underlying motivation of including the city-region context is the conviction that food security should consider the regional food supply potential as one of the pillars for ensuring a certain food autonomy in the time of global food chain disruptions as experienced during the COVID19 pandemic crisis, military conflicts, natural disasters (volcanic eruptions, floods) or any climate change-related occurrences. Another reason for relying more strongly on the regional food system approach is the prospect that local/regional food chains will substantially cut down on food-miles (the distance between

production-processing-retail-consumption) impacting climate, other environmental media as well as all related socio-economic costs. [Sylla et al. \(2022\)](#) compared the carbon footprint of a local-regional vegetable box-scheme of the Ostend [agropark Tuinen van Stene](#) (Ostend City, 2024) with the same products sold in supermarkets and being sourced internationally. The researchers concluded that ‘if the groups of products to which they belonged were purchased from a global supply chain rather than an agro-park, the carbon footprint would be 641 times higher’. Another asset of strengthening the regional food system in terms of diversification and short food chain strategies is the added value for the regional agro-food economy via new business plans, actors and employment opportunities. However, aware of the fact, that not each city region has the agricultural resources for supplying all citizens with regional food, and the consideration that other regions offer food resource qualities in terms of climate and soils that are superior towards many other regions (hence being of special value to more than the region in question), a city-region food system approach is not meant as dogmatic principle, but an important criteria for optimising regional land use.

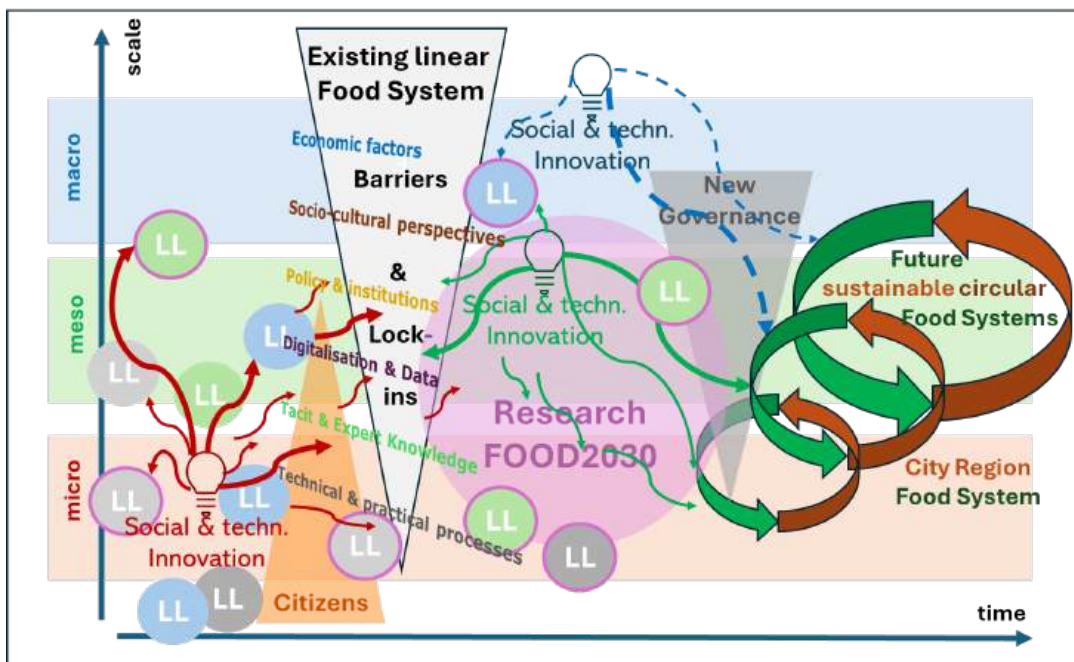


Figure 8: Theory of Change showing the impact of social & technological innovation via diverse Living Labs (propelled by research) to tackle barriers & lock-ins of existing food systems at micro-, meso & macro level - supporting citizen-participation & new forms of governance in the transition towards future sustainable circular food systems (Wascher 2024 after Geels and Schots, 2007).

Based on the above, we propose the following guiding principle(s) for Sustainable Food Systems: *Sustainable Food Systems are based on value chains that are dynamic due to market- and governance-driven factors, where (city-)regional geographical and environmental conditions (co-)define system boundaries with respect to food security, resource efficiency, circular economy principles, biodiversity values and multi-actor participation with special attention to the protein and energy transition making use of social and technological innovation along the full sustainable value chain.*

## 4.2. Implementation framework

Living Labs can act as facilitators for addressing institutional inertia and can help in overcoming some resistance for sustainable change from institutionalized entities, like municipalities and political councils. This narrative is offering solutions to the barriers and lock-ins experienced by the food stakeholder from the Focus Group discussions and working alongside with researchers on strengthening evidence-based approaches of Living Lab activities, it has the potential to strengthen the Science-Policy-Interface. By addressing the action space of Living Labs, transition managers and other food innovators to overcome barriers and lock-ins in the transition process (by means of data and innovation-driven approaches), we are putting forward an implementation framework that allow monitoring over time and illustrate the likely action space of these players at the micro- and meso level.



Table 4: Implementation Framework for cross-scale operations to remove lock-ins and barriers in the food system

| Macro                                                                         |                                                                                                                    |  | Meso                                                      |                                                                         |  | Micro                                                     |                                                                                                                  |  |  |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------|-------------------------------------------------------------------------|--|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--|--|
| international, national                                                       |                                                                                                                    |  | (city-)region, inter-region                               |                                                                         |  | Local / urban / sub-urban                                 |                                                                                                                  |  |  |
| SYSTEM LOCK-INS: Economy – Policy: Economy – Policy – Culture – Culture       | Initiative / Lead                                                                                                  |  |                                                           |                                                                         |  |                                                           | BARRIERS: Communications & Trust – Knowledge Gaps – Institutional Inertia<br>Market Dynamics – Complex Realities |  |  |
|                                                                               | NGOs & CSOs                                                                                                        |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
|                                                                               | Food 2030, SDGs, SCAR, international & national organisations                                                      |  |                                                           | Cross-border initiatives, regional policy labs, metropolitan governance |  |                                                           | Living Labs – Municipalities, Food Hubs                                                                          |  |  |
|                                                                               | Formats                                                                                                            |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
|                                                                               | Lobbying, campaigning, coalition building, Co-governance, strategic partnerships, Knowledge sharing, policy briefs |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
|                                                                               | International conferences and campaigns                                                                            |  |                                                           | Regional strategies, land use planning, regional sectors                |  |                                                           | citizen platforms, local events, education                                                                       |  |  |
|                                                                               | Target groups                                                                                                      |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
|                                                                               | Citizens, funding institutions, research, education, policy makers innovators                                      |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
|                                                                               | FAO, EU and global institutions, EU presidency countries                                                           |  |                                                           | Regional administrations and organisations, rural communities,          |  |                                                           | Stakeholders along food chain                                                                                    |  |  |
|                                                                               | Information & Data                                                                                                 |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
| harmonisation, reporting, impact assessment, inventories, indicators, tools   |                                                                                                                    |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
| One stop data warehouse, international references                             |                                                                                                                    |  | Cross-regional and -national cooperation                  |                                                                         |  | focus groups, interviews, surveys,                        |                                                                                                                  |  |  |
| Monitoring                                                                    |                                                                                                                    |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
| food system reporting with a standard methodology at different time intervals |                                                                                                                    |  |                                                           |                                                                         |  |                                                           |                                                                                                                  |  |  |
| Establishment of a European Topic Centre for food reporting                   |                                                                                                                    |  | Regional stocktaking sessions, sustainability scoreboards |                                                                         |  | Project check-ins, TRL & IRL, regular stakeholder surveys |                                                                                                                  |  |  |

# 5. Strategy actions and implementation

## 5.1. Tentative Strategy Actions with Case Examples

To develop a strategy for unlocking a sustainable food system, it is crucial to focus on key leverage points that can drive transformative change. Here's an approach that combines social and technological innovations to address food system lock-ins:

### 5.1.1. (I) Macro-level approach

#### Ia Reform of CAP

- Take up policy measures and awareness programs to encourage healthy and sustainable diets.
- Introduce regulations to incentivize sustainable food choices through pricing mechanisms, such as lower prices for healthy options and taxation on unhealthy foods
- Develop transparent relationships with informal sector actors like traders, processors, and retailers to improve food distribution efficiency.

#### Ib Invest in Sustainable and Diverse Farming Systems [input WP4]

- Shift focus towards producing a diverse range of nutrient-dense foods rather than just calorie-rich staples.
- Support innovations for more diversified, intensive, and sustainable farming practices.
- Promote agroecology and organic farming methods to improve soil health and biodiversity.

#### Ic Address Social and Economic Equity

- Invest in social safety nets and public emergency aid to ensure disadvantaged populations have access to affordable, healthy food [1].
- Empower women and youth in decision-making processes related to food choices and agricultural practices [1].
- Promote inclusive economic growth through responsible investments in agriculture and food systems [4].
- New non-economic metrics from food innovation that non-monetized parameters practices promoting food equity and s

In the following we show an example for a possible strategy implementation scenario for the macro-level approach, based on the information gathering during the Focus Group meeting

#### Id Harmonisation of international standards, indicators and policies

- Cooperate with European institutions (European Commission, JRC, European Topic Centres, etc) and make use of existing standards and references by relevant organisations when establishing new procedures, guidelines and indicators.
- Restrain from developing isolated or 'stand-alone' platforms, procedures and databases outside existing international and harmonised approaches

- Promote the wider cooperation between researchers, policy makers and food chain actors to streamline efforts
- Make new techniques, standards and knowledge items widely available via multi-language apps for mobile phones and personalised data settings.

The limited finance allocated for radical food system transformation has been suggested as a factor to explain the slow and incremental pace of scaling innovation at the macro-level (CPI; Diaz-Bonilla et al., 2023). EU law requires all large companies and all listed companies (except listed micro-enterprises) to disclose information on what they see as the risks and opportunities arising from social and environmental issues, and on the impact of their activities on people and the environment (EC, 2024a). DG-FISMA overlooks the CSRD implementation, as well as the so-called EU Taxonomy regulation.

### **le Make sure that socio-cultural lock-ins are properly addressed by multi-level, region- and issue-specific mechanisms**

- Address socio-cultural issues related to the envisioned innovation early in the process to make sure that behavioural change is properly addressed.
- Cooperate closely with the social sciences and media, policy institutions, communication experts and all relevant sectors at different scales to embed food chain innovations into the wider cultural spectrum.
- Ensure high visibility and impact by coming up with new narratives for a wider societal engagement beyond research and policy - e.g. in lifestyle, youth movements, the arts, exhibitions and mass mobilisation events.

### **Case Example macro-level: Food sustainability labelling at the European level**

For the development of a new approach towards food labelling (see Figure 9) we have chosen for a technical-digital innovation that can be considered a typical macro-level topic. This is because food labelling mechanisms thrive upon large data sets and standardised indicator sets deriving from and making use of Life Cycle Assessments (LCA) for a large number of products (3000+ per country). Both the practice of LCA as well standardisation require a long-term approach involving industry, consumer organisations, retail and research.

In the cases discussed, the participants of the Focus Group 2 favored a multi-stakeholder European approach in order to achieve a robust, transparent and science-based approach to food eco-labelling. It is obvious that such a goal cannot be reached solely by Living Labs, supermarkets at city level or purely by research organisations. This case hence qualifies for being considered predominantly as a macro-case innovation that involves stakeholders from an international, EU-wide scope. This does not mean, however, that the meso- or micro-level actors cannot play a role in it. E.g. a set of living labs, if well distributed and following a common methodology, could be instrumental when running test labelling interventions on a local level in different cities. In this case, Living Labs should be considered mainly as support units for national-international research.

On the other hand, Living Labs are not in the place to establish a new labelling device in their operation field at the micro and/or meso level, simply because retail and governance would most likely require high level agreements to ensure long-term solutions. This is exactly what researchers are engaged in: organising international workshops and events

in cooperation with large retailers and EU policy representatives. Next to macro-level policy initiatives in support of a harmonised approach, there is also a need to address the cultural-social lock-ins on how consumers perceive the value of eco-labelling.

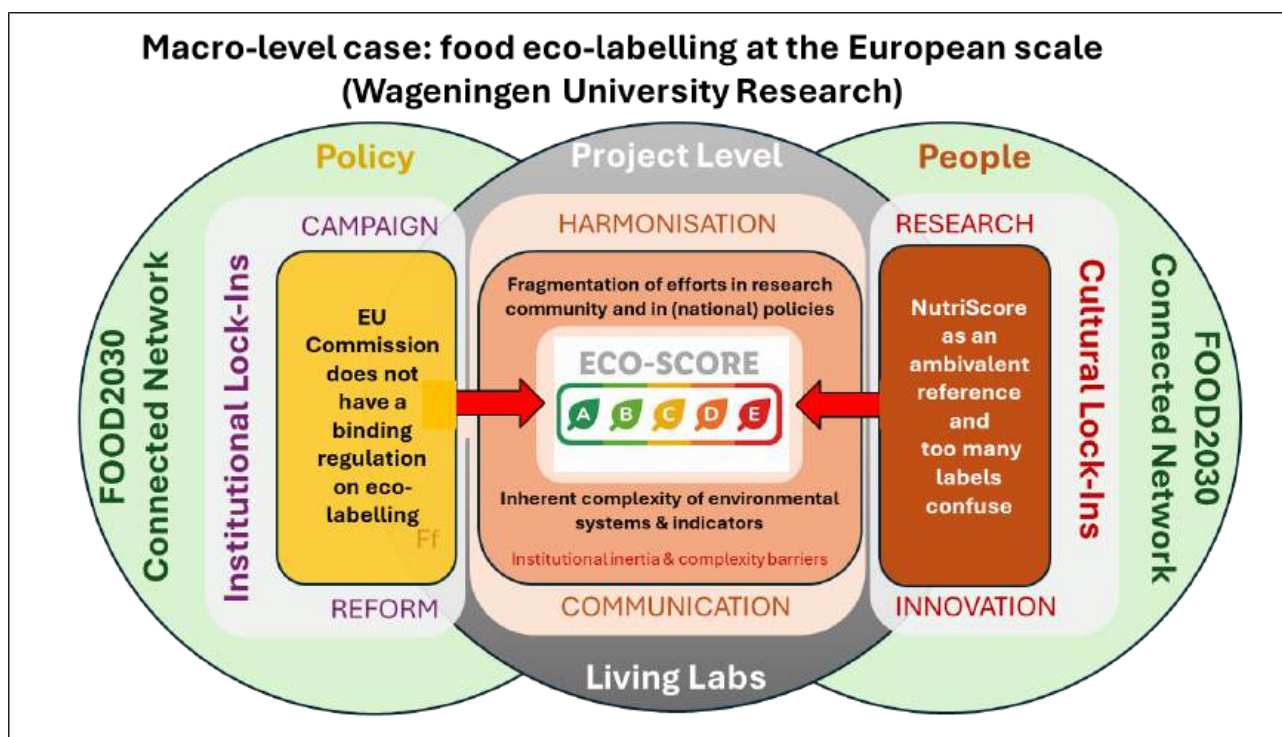


Figure 9: Macro-level case, illustrating support actions for the food eco-labelling initiative by WUR and other organisations.

As Figure 9 illustrates, the Focus Group participants also recognised aspects that can best be described as ‘barriers’ - hence not necessarily systemic, but more at a practical-technical level, though not of a regional-local nature.

This points to the fragmentation of efforts and communications at the level of research and with regard to national policies. Participants felt that better internal alignment between research departments but also in the communication towards national policy makers are obstacles/barriers against an efficient and inclusive transition process. Internal processes and communications are sometimes not properly followed up because all the attention goes to the external lock-ins, not realising that institutional gaps and methodological inconsistencies require attention as well or even first.

Another aspect, namely the ‘inherent complexity of environmental systems (and indicators)’ are posing problems in explaining the rationale behind food/eco-labelling. Here cooperation with design or communication experts should be considered when engaging with stakeholders at the micro- or meso-level.

In all of the above, we see the Food 2030 network as being highly relevant when it comes to supporting project partners, innovators and living labs in the above efforts. New methods and tools can be shared and messages streamlined in order to create more impact and clarity of efforts across countries and sectors.

For understanding some of the details of the food-labelling approach we refer here to the Focus Group synopsis as displayed in Annex 2 as well as to a more extensive description of the ongoing initiatives around food environmental labelling in Annex 5 of this document where additional reads are suggested. Annex 6 covers the recommendations as derived from the Report of the Court of Auditors on food labelling in the EU (ECA, 2024) are shared. All the recommendations by the Court of Auditors were accepted by the EC with the implementation deadline of 2027 in the Replies by the EC (EC, 2024).

### 5.2.2. (II) Meso- and micro level approach

#### **Ila Strengthen Value Chains and Market Access**

- Develop alliances with the informal sector to improve food marketing systems between rural and urban areas.
- Utilize new information and communication technologies (e.g., food apps, blockchain) to enhance market linkages.
- Support short supply chain management to connect food producers directly with consumers.

#### **IIb Enhance Food System Resilience**

- Improve the viability of agricultural businesses, especially micro, small, and mid-sized sustainable farms.
- Provide comprehensive, culturally responsive technical assistance to farmers.
- Invest in diversification of product lines and support for sustainable agricultural practices.

#### **IIc Foster Collaboration and Governance**

- Define and introduce good governance principles, including inclusiveness, transparency, and accountability.
- Establish a broad constituency involving public and private stakeholders to bridge the divide between consumption and production.
- Consider creating a dedicated political entity, such as a Ministry of Food, to coordinate food system actions.

#### **IId Leverage Technology and Innovation**

- Integrate digital technologies and novel financing mechanisms to enhance collaboration along value chains.
- Invest in infrastructure and technologies that enable off-season supplies of fresh foods and promote circular resource use.
- Develop and implement food waste reduction strategies using technological solutions

#### **Case example meso level**

Positioned between the micro (local) and macro (national-international) level, the meso level approach has organisationally and spatially an intermediate orientation and because of this is eventually more difficult to define than the other two. Figure 10 shows the results of the FG meeting deriving from the initiatives under [Foodshift Pathways](#) - an Erasmus+ ongoing project which seeks to strengthen the role of sustainability teaching at the school level (primary & secondary as well as professional secondary (MBO)). The example illustrates that also here we encounter lock-in situations - in this case at the

policy-institutional and at the knowledge level. These institutional lock-ins have to do with the overall situation that national curricula do not explicitly address food system topics in the participating countries and certainly not food system related ones. This makes the ambition of each teacher and each school quite challenging as the topic is considered to be an 'add-on' in competition with the pressing obligatory/official curricula items. Obviously, integrating food system teaching at the macro-level - the national binding curricula - would change this situation tremendously.

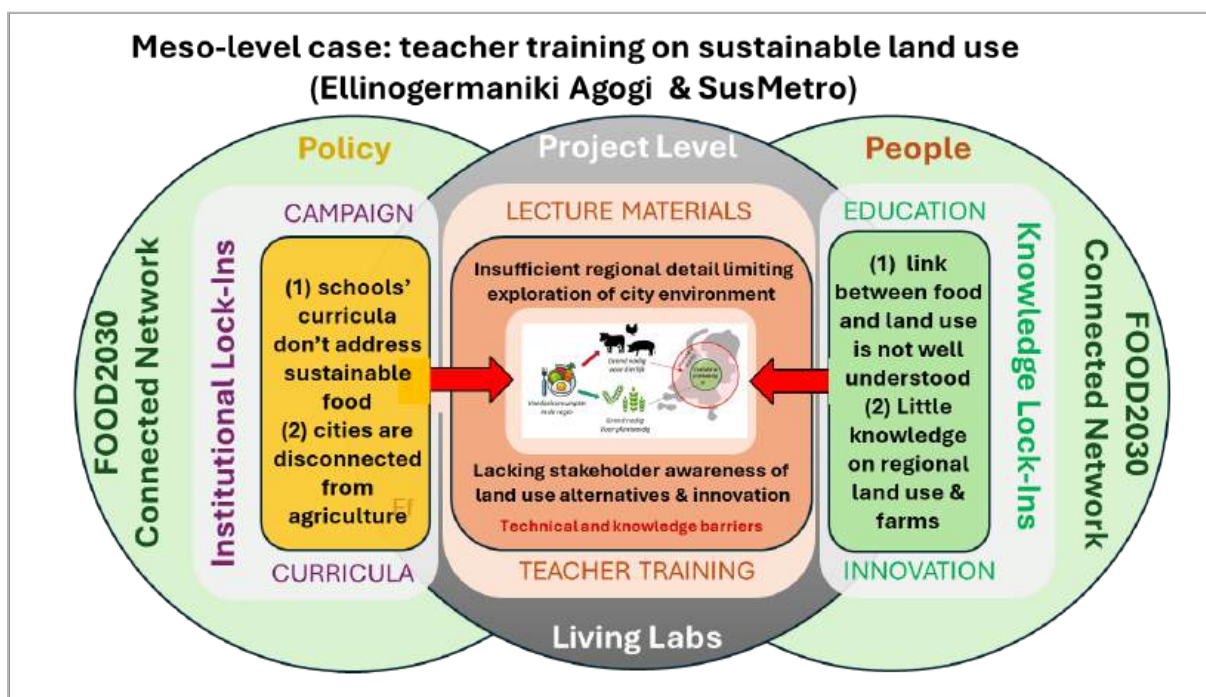


Figure 10: Meso-level case, illustrating support actions for the teacher training initiative by FoodSHIFT Pathways led by EA with special focus on the ecological footprint tool developed by SusMetro.

According to the [needs analysis](#) of the FoodSHIFT Pathways project (teacher surveys and focus group discussions) (Dubbeldam and Wascher, 2023), there are knowledge gaps among teachers, parents and the wider public when it comes to healthy and sustainable food issues. Despite the fact that food is being addressed in many media channels with daily reports about obesity, too much sugar and fat-rich food, animal welfare and the impacts of agriculture on groundwater and biodiversity, it seems difficult to provide a coherent narrative about the different issues. One of the difficult aspects is the understanding on how different diets affect the landscapes around us - more concretely, how much landscapes have already changed and become more monotonous due to the impacts of intensive livestock-farming. We therefore have picked the Foodshift Pathways example of 'land use change & ecological footprint assessment' that focuses on the city region outside the city boundaries. These metropolitan regions are actually a typical meso-scale as it is in the close proximity to the urban consumer where more and fresh vegetables and fruits could be produced to reach the urban markets. Instead - most of our supermarket food is imported from remote locations and the animal feed that dominates most metropolitan landscapes is mixed with imported soya from Latin-America for meat production. The meat produced causes excess nitrate emissions, groundwater problems, odors and monocultures. Hence, the direct impacts of our linear meat-based food system

is heavily impacting on the landscapes and human health of cities and should be a topic of discussion in sustainability education.

The example in fact illustrates how much micro-, meso and macro issues are intertwined. Nevertheless, we consider the role of schools and teaching about land use change a typical meso scale issue as children should learn about the role of agriculture in their direct proximity and understand that their food choices have a direct impact on the land that surrounds their city. Here dedicated schools and teachers have shown that they can make a difference and - even when being confronted with lock-in situations at the policy and knowledge level.

The latter should be addressed by school boards and (inter)national network organisations organizing conferences and webinars on sustainability education, carrying the message to national institutions and joining forces with other networks of schools. Though transition is moving slow also here, the examples from the Foodshift Pathways countries have shown that more initiatives are taking shape with regards to pushing food education more to the forefront of the curricula of schools and that countries are becoming more aware of the lack of structural food education in schools. Obviously, school food procurement is part of these efforts - but not addressed here because it was not part of this specific FG session.

### **5.2.3. (III) Micro level approach**

#### **IIIa Strengthen Rural-Urban Links**

- Define and introduce good governance principles, including inclusiveness, transparency, and accountability.
- Establish new interfaces between urban and rural actors by means of events, personalized sales, off-vehicle sales in city, pop-up food markets

#### **IIIb Establish Food Governance Structures**

- Define and facilitate community structures to define and implement collective strategies with the participation of stakeholders from the quadruple helix and from rural and urban environments

#### **IIIc Strengthen Citizen Participation**

- Offer spaces for participation through volunteering schemes such as community supported agriculture, citizen science, peer learning spaces or community kitchens

#### **IIId Make the Food Environment more Sustainable**

- Specially focus on local food environments transforming existing (community) infrastructures but also creating new alternative ones with more systemic approaches.



Figure 11: Micro-level case, illustrating support actions for the citizen participation initiative by IrsiCaixa.

From a micro level perspective, we consider food innovation efforts to involve local actors operating within a local food environment. Examples of such actors are local food producers, citizens, local food councils and other local food communities, such as community gardens. To move away from incremental innovation to more radical forms of innovation, intermediary structures such as Living Labs combined with new (digital) solutions are needed that will bring these local food actors together and facilitate a platform to work jointly on the co-creation of healthy, inclusive and sustainable food systems within their local food environments. Ultimately, the accessibility, availability and affordability of healthy and local food within a food community or region is the collective objective that should be pursued.

In Figure 11 we display the results of the Focus Group meeting with the Living Lab for Health at IrsiCaixa that is working on a digital solution that, apart from technological innovation, aims for social innovation within the area of local food system strengthening. It is a research-oriented Living Lab based in Barcelona (Spain), which is currently in the phase of developing a multi-stakeholder and web-based platform: [The Alison Platform IrsiCaixa \(2024\)](#). The target audience of this platform are the inhabitants of vulnerable neighborhoods in Barcelona with the goal of promoting healthy, sustainable and locally-available food through a systemic, collaborative and decentralized food innovation network. The open-access platform will promote the exchange and interaction for open networking on the design of participatory processes on local food system strengthening, bringing a diversity of social actors working on food system stage on a local/regional level.

In terms of the type of intervention, the digital platform aims to promote positive food behaviour changes in local food environments, explore funding models for the innovation networks in each community, and aims at improving the local food strategies of the food stakeholders that are part of the platform, while enhancing the social wellbeing of its users. In the line of social innovation, this means that local actors that use the platform adopt

bottom-up approaches to resolve local problems autonomously, while stimulating cultural change ([Schafer & Kieslinger, 2016](#)).

Figure 10 illustrates that on the micro-level, both barriers and lock-ins are encountered, which in this case happens at the economical, socio-cultural and internal project level. Regarding the latter, digital and knowledge barriers are experienced by the users of the Alison platform, which points to the need of drafting solutions based on co-creation, accessibility and inclusivity. Both digital coldness and digital illiteracy are barriers that are further touched upon by a stakeholder from the Alison platform during the FG discussion: “We are in an environment with a great multiplicity of channels, many messages, a lot of information or “infoxication”. So, there is a lot of competition for attention in the virtual environment and I think that does not make it easier to develop and promote an environment of this type and make them enthusiastic for a new digital platform.”

As the platform is aimed at organizations interested in food system transformation and citizens, the barrier of digital illiteracy will mainly affect the latter. This barrier can be overcome by making sure the platform is easily accessible for both digital beginners and experienced users. Think of low-threshold navigation and simple step-by-step plans. The barrier of digital coldness, on the other hand, can be overcome by adding an element of human interaction, which is further expanded by the comment of a FG participant stating “that there are occasions for meetings on these sort of platforms, so you know who is the person who is writing to the other on the other side of the screen. That need, in the end, points to the importance of adding a human component that accompanies this process, otherwise it is very difficult for such a digital solution to prosper on a social level.”

It becomes clear that the food innovation narrative of IrsiCaixa is that social food innovation can be supported by technological innovations (such as digital community platforms for citizen participation), when the issue of digital access and digital coldness is seen as an issue to be taken into account when the Alison platform is being shaped for its future users.

For this, face to face meetings can be used as a medium to organize monthly offline workshops to work on the co-creation on the design, functionalities and usability of the online platform. Here it is important to make sure to have a digitalized feedback system in place that collects the user-experiences of the platform and that changes can be made according to these evolving needs. This, in turn, strengthens the Participatory Innovation Culture on a micro level and helps with the process of understanding how the platform can help users or add value to their lives, so they will be more likely to use it.

In terms of strengthening rural-urban links and establishing new interfaces between urban and rural actors, human-centric digital solutions should be promoted by offering opportunities for volunteering, collaboration and communication. For example, creating personal stories around local food on the platform, by sharing stories of local farmers and local food consumers. This makes technology more tangible and accessible. Combining this with storytelling, this means creating content that touches upon the emotions and values of its users (e.g. stories about family, tradition and the origin of food). Storytelling can be supported by gamification techniques within the platform, integrating typical elements of game playing (e.g. point scoring, “competition” with others) to encourage engagement with the platform.

To further expand on the human component, the use of social media channels can be beneficial in translating the content from the Alison Platform into social media outreach activities (e.g. Instagram) that are playful and simple in their messaging. This has the potential to create a community of Alison people, introduce the “faces” of the members and attract new community members. The use of local influencers, such as local chefs and local food ambassadors, can help with the promotion of these platforms by acting as “role models” for the platform users.

On top of that, it is evident to understand how the platform can help users or add value to their lives and how they connect to it, so they will be more likely to use it. Local food is tied to traditional culture and social interactions. It therefore is important to preserve that tradition and integrate it into the digital experience.

In the end, micro level impact goes hand in hand with food sovereignty: the right of people to both healthy and culturally appropriate food produced through ecologically sound and sustainable methods ([VSF International, 2009](#))

### **Take-away on micro-meso-macro food innovation**

By focusing on these key areas, this strategy aims to unlock the food system by addressing both social and technological aspects. It emphasizes the importance of collaboration across sectors, sustainable practices, and equitable access to healthy food. The approach recognizes that transforming food systems requires coordinated efforts at local, regional, and national levels, supported by strong leadership and public-private partnerships [1][3][4].

## **5.2. Strategy Implementation**

The implementation of the FUS Strategy will depend largely on achieving a high degree of co-ownership amongst the different actor groups within the Food 2030 network and the wider EU food network.

The authors of this document are aware of the fact that the actions presented in the previous sections can come across as challenging and additional tasks. In the light of full research and policy agendas, fragmented food system actor groups, limited project and living lab funding and durations schemes. This goes hand in hand with shifting societal and political priorities or majorities. The recent developments around the European policy agendas Green Deal and Farm to Fork Strategy have demonstrated that non-binding frameworks and communications are far from providing the stable grounds needed for a steady and progressive implementation of food system action plans as outlined under this FUS Strategy.

On the other hand, it is this particular absence of formalised legislative instruments that creates room for more radical research, campaigning, experimenting, innovating, knowledge sharing, reporting and policy dialogues for the fastening of food system innovation. Working with the Focus Group participants and different Food 2030 partner projects and organisations, we realised that a more focused and streamlined approach towards overcoming barriers and lock-ins has received not only acceptance, but has been welcomed as an important ‘missing link’ in the chain of actions we are involved in.

Though we did not research this particular question - we assume that most participants who have joined this process - and these are admittedly mainly research organisations and a few policy actors - have realised that the multitude of efforts targeting at food system



transition still lacks consistency in coordination and effective follow-ups: there are meanwhile (too) many toolkits, indicator reports, assessments, policy briefs and conference outputs which seem to overlap, sometimes compete and then disappear again without concrete follow-ups for practical implications, making valuable action points become tangible. Obviously, the FUS Strategy is facing the same risk here and needs close monitoring on the progress of the strategic actions proposed for the selected innovation cases.

However, recent developments at the European level, especially the launch of the Food 2030 connected project and lab network, as well as of the [HORIZON Results Booster](#) (Booster, 2024) show that efforts are underway to overcome the fragmentation of efforts and to commonly work towards higher impacts.

This is where the FUS Strategy sets in: in the following part we will present a rather pragmatic and concise implementation framework that seeks to build upon existing food innovation developments and cooperations and thereby minimizes additional resource use. At the same time it is clear that working towards higher impacts will require some clear steps and commitments by those engaged in the process.

The way we envision both the implementation of the strategic action points and monitoring of those, the FUS Strategy is to operate along the lines of the macro-meso-micro approach. While Table 1 and 2 have provided a set of parameters and characteristics for these three impact levels, it is clear that the food system transition is too complex to just be divided into three portions. However, the underlying rationale of creating more focus and transparency in the transition process justifies the approach we outline here.

In the following section we describe the envisioned implementation modes together with the associated monitoring processes, because we see close relationships between the two.

### 5.2.1. Macro level implementation

Addressing the predominantly macro-level lock-ins involving European and international institutions as well as deeply rooted socio-cultural perceptions and social and cultural preferences when dealing with food, can be considered the most challenging strategy objective. As mentioned in the beginning of this section, European projects, actors along the food chain - even municipalities with strong food strategies in place - and innovators are faced with both dynamic as well sometimes with slow-moving system realities for which it appears extremely difficult to find openings that can allow for change. Here we frequently refer to the need for more 'radical' or 'breakthrough innovation' in order to shake up the current system.

As we believe that changes at the macro-level require strong focus and synergistic forces to create momentum for change, we propose that the Food 2030 community should:

- identify a small set of key objectives/priorities at the yearly basis with monthly progress check-ins to make sure that the message and the (sub)goals stay clear and not diluted into too many directions/ambitions (creating 'punch');
- build upon meso-level activities in which especially the research networks and regional players engage in harmonising their activities, data and standards ... hence the narrative;

- prepare these efforts well, this means at least with a screening and dialogue process that starts one year in advance, even a multi-annual planning scheme can be considered in which priorities build-up and are in a rational order
- organise a key event for placing the macro-topic priority scheme - e.g. reform of CAP to name just a major challenge - onto the policy agenda, e.g. of the country that takes the European Council presidency;
- seek strong partnerships with key players at the national and international level
- promote food-related issues in different communication channels (e.g. [Forum for the Future of Agriculture](#)) or similar/future high profile events;

The goal is hence not to plan new events and processes, but to turn existing events and processes into a podium on which FUS Strategy actions are hinged upon - taking advantage of the resources and energy that is already in place. Therefore early and targeted preparation is needed - which will, admittedly, require planning, resources and input.

As a first step for starting the macro-level approach, we hence propose that Food 2030 invests time and engagement to address the question of macro-lead and ownership as a vital prerequisite of getting the process started.

### 5.2.2. Meso-level implementation

As mentioned earlier, the meso-level is considered as offering the critical operational space in terms of geographic context (e.g. the City Food Region, the foodshed, the metropolitan food landscape) and wider systemic food system networks and actors. Linkages and interactions with the macro- and micro-level are part of this. Though European projects could be considered as macro-level approaches - and some of them are - especially food projects are rooted in national and regional data and actor networks - bridging the gap between ground-level approaches at the micro-level with international programmes, standards and assessments at the macro-level.

Another aspect is that the meso-level corresponds with what is considered a more inclusive, regional and circular food system as it combines place-based approaches with food chains that link producers and consumers across rural areas.

The meso-level implementation will focus on:

- the existing Food 2030 network of projects which are considered to already work towards FUS Strategy objectives on a regional level.
- the regions and cluster of cities with metropolitan surroundings where sustainable food chains are part of a circular economy that includes also non-food sector aspects such as recreations, bio-based building, nature and biodiversity;
- in terms of monitoring, we propose that EU food projects will proactively - on their basis of their own research agendas and resources - contribute to a Food Transition Reporting process led by Food 2030 that uses a set of indicators to describe progress on a regular basis in reaching FUS Strategy objectives.
- Future EU projects shall be set up in to systematically provide input to the reporting process - which shall not amount to more than 3-4 project days per year;
- the HORIZON Results Booster shall be 'upgraded' to co-lead together with Food 2030 the meso-monitoring of the transition

- as a result, there shall be two EU Food Transition Reports that will provide input to (1) measuring progress over the years, and (2) to the macro-level key issue identification for yearly impact themes.
- Half-yearly evaluation reports - drawing largely on the project reporting obligations - as input for agenda setting for macro-level impact events.

As a first step, Food 2030 should develop a reporting template for meso-scale reporting.

### 5.2.3. Micro level implementation

Some observatory of food systems have claimed that true transition is and should mainly happen at the micro level - where food is being produced, processed, consumed and entering - hopefully - again a circular road of reusing reststreams.

As we have shown, innovation is happening at all three levels and ideally, all levers are integrated with each other. In many EU projects, the micro level stands synonymously with the activities of Living Labs - especially when they are located at municipalities or - in many cases - in only parts of the city. However, there are policy Living Labs which deal with both the city and the surrounding areas.

Still, Living Labs and their focus on the concrete, location-based, stakeholder-oriented level involving schools, farmers, food banks, restaurants, citizen groups, community farms and all sorts of food chain business are the places where micro-level transition is already happening. In terms of implementing the strategy, we see the following approach to be put in place on a more consistent basis:

- Further online and physical networking activities as part of the Food 2030 Connected Lab Network (CLN) in terms of knowledge sharing and best practice exchange targeting specific food topics with specific working groups (e.g. "Food Waste working group", "Community gardening working group" etc.)
- More frequent and systematic communications and agenda setting regarding the efforts to tackle barriers as well as lock-ins, where possible using online platforms.
- further development of the Focus Group approach towards a regular stock-keeping evaluation of LL efforts with respect to the strategy actions
- Monitoring of the Living Labs across all projects (Food 2030 CLN) with quarter-years evaluations and yearly summary transition reports as input to the meso reporting
- organisation and creation of funding opportunities for Living Labs and other food innovators (e.g. with non-commercial outputs) and the organisation impact investment events for these stakeholders and LLs.

## 5.3. Strategy monitoring

Figure 12 illustrates the envisioned implementation-monitoring approach for a timeline of five years starting in 2025. The approach follows the rationale of the micro-, meso- and macro-level concept as different organisations and stakeholders will be involved at each level. Starting from the bottom, we see mainly Living Labs and municipalities in the lead role as agents for food system transition and are especially associated with research projects and institutions. However, as mentioned earlier, we take a rather wide definition of

Living Labs as indicated in the term Change Driving Initiatives (CDI), but also a locally engaged Community of Practice. Important in this context is their placed-based operational action field.

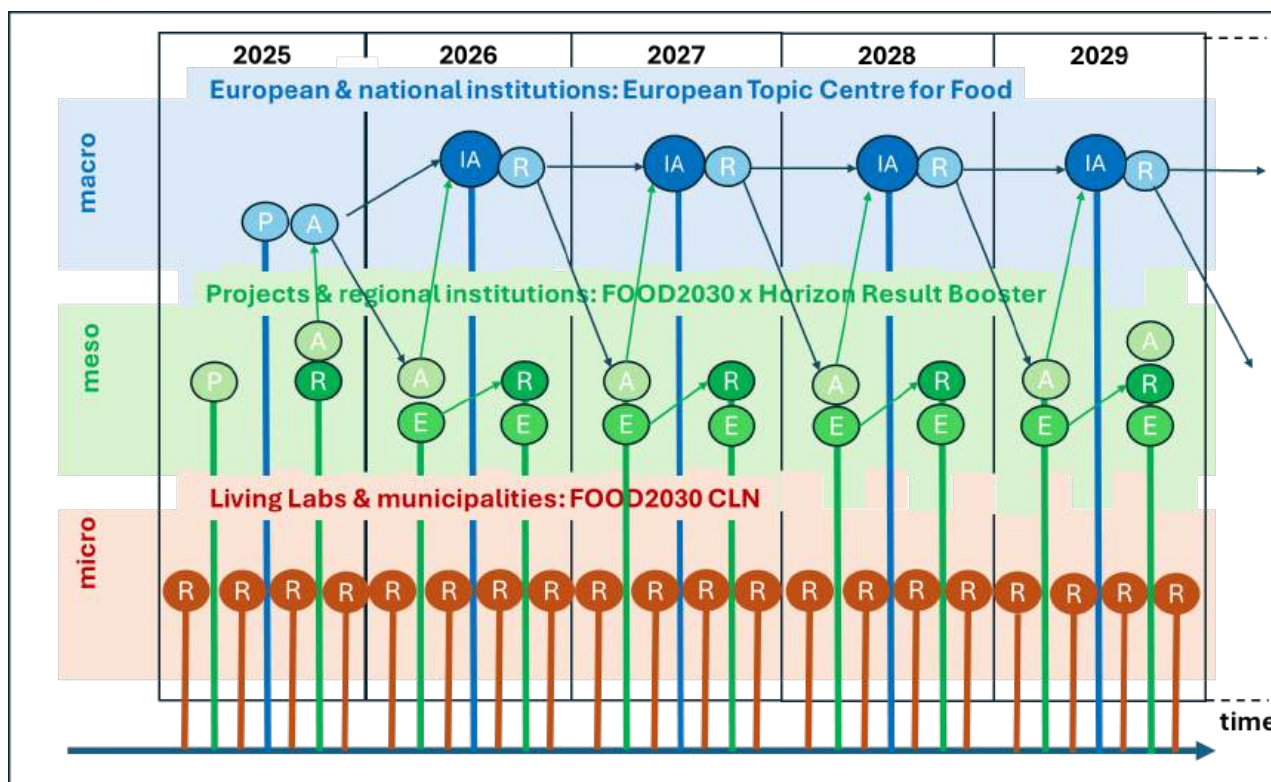


Figure 12: FUS Strategy implementation scheme for the first 5 years programming Reporting (R) at the micro (quarter yearly) and meso level (half yearly), the latter in combination Evaluation (E) procedures mainly to feed into meso level reporting. the meso-level reporting feeds into setting the Agenda (A) for the yearly macro-level Impact Actions (IA) which will be reported upon as well. In 2025, activities are mainly targeted. Preparations (P) for a full-fledged strategy will start in 2026.

### Micro-level Reporting

As monitoring is basically ‘measuring progress in the transition towards a more sustainable food system, we suggest turning the assessment method of the Focus Groups into a monitoring device. This involves

- revisiting the existing 10 FGs lead institutions and ask them in a period of 3 months to report back on a set of progress indicators with regard to overcoming barriers and lock-ins. These queries should only take about 30min.
- inviting other Living Lab (and related organizations including municipalities) to join similar FG meetings as undertaken in the preparation for this strategy. These will have the character of ‘intake’ sessions to put these initiatives onto the strategy map.

All officially acknowledge LLs will thereafter commit to the 3-monthly transition monitoring. The results will provide a ‘moving picture’ on the progress and delays in the transition. A part of the micro-level monitoring exercise, we will identify key problems as well as best practice examples in coping with barriers and lock-ins.

All micro-level activities - maintaining and extending the FG approach towards an ongoing assessment process and database (possible under the name of 'Transition Impact Groups') as well as the quarter-yearly reporting on their progress will be orchestrated by Food 2030 Connected Lab Network coordinators CLEVERFOOD. In the future, this service should become part of a European monitoring service unit - e.g. under Horizon Result Booster.

#### Meso-evaluation sessions: facts & figures

At the meso level, we see mainly a half-yearly project-based approach in which Food 2030 gathers targeted information on the barriers and lock-ins as addressed in EU food project. The project coordinators but also the relevant task leaders will receive the summary report from the micro-level reporting as input for a dedicated webinar session in which these results are made available and in which we call for a common evaluation. The results of these Meso-Evaluation sessions shall be concise, measurable and targeted towards actions. Any stakeholder from the wider food system network - whether citizen or industry player, should get access to the meso-level database.

Meso-Evaluation facts and figures should provide direct input to setting the agenda for both actions at the meso-level and macro level, e.g. call for cross-project initiatives addressing pressing food system barriers and lock-ins, offering training courses, policy hearing or any kind of initiatives that are considered to create impact at the meso level. This means that the results of the Meso-Evaluation sessions are considered to feed into all kinds of meso-events, also those which are driven by organisations and networks outside the Food 2030 projects. In essence, Meso-level monitoring output (facts and figures) on progress regarding the food system transition should become widely available to all stakeholders and initiators. Due to the need of preparing the format for these Meso-Evaluations, we propose to start with it in the second half of 2025.

#### Macro-level Impact Events

Using the agenda setting input from the half-yearly Meso-Evaluations (first one expected in June 2025), we will organise one or more Macro-level Impact Events targeting national and international policy, business/industry and cultural event. These events are meant to be well prepared by lobbying and promotional activities to ensure proper timing for the agenda setting. At the European policy level we recommend to closely synchronize with those countries leading the European Council Presidencies, with the existing circuit of events around the Forum for the Future of Agriculture as well as with other major events such as the Green Week in Berlin and the like. This also means that such Macro-level Impact Events should convey the messages by using multiple communication channels and involving outstanding and widely acknowledged spokespersons - they may come from science and policy, but entirely different backgrounds (e.g. from the arts and entertainment) should be considered as well. Since such high-profile impact events at the political and societal level require proper preparations, we see the first macro-events of this type only to start in 2026.

## 6. Conclusions

The implementation of ten Focus Group meetings across a wide range of European geographic locations and food system innovation topics has not only been a rewarding proof-of-concept (in this case 'proof-of-method') in terms of gathering first-hand information on 'field- and action-based' experiences with barriers and lock-ins; it was also a kind of inauguration of the Food 2030 Connected Lab and Project Network implementation in 2024. The FG results have shown that it is possible to pin-point the variety of transition narratives down to a set of concrete observations and to translate these into tangible strategy actions and monitoring procedures to arrive at a more sustainable food system.

Taking into account the Focus Group results and drawing upon the findings of other relevant EU food projects and range of recent publications, this deliverable document has outlined how both the existing projects and the research environment can be turned into a 'Transition Support Infrastructure' that can potentially allow for an increased synergy and concerted actions at the micro-, meso- and macro level. While the emerging Food 2030 Connected Lab and Project Network provides - for the first time - a solid ground for implementing and monitoring large parts of the FUS Strategy, it is clear that both institutional and organizational innovation is also needed at the very base of our own EU research and policy architecture. This means that we need more long-term funding and support perspectives for Living Labs, a stable and more systematic approach for using results and achievements beyond the current EU Horizon Result Booster and more consistent and targeted actions at the macro level to make the transition really happen.

We propose that the Implementation and Monitoring section of this deliverable report becomes a *Living Strategy* document to be updated according to the processes outlined in Figure 12.

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# List of Annexes

## Annex 1. Literature review

Please note that we found the review undertaken in the **ENFASYS PROJECT REPORT D1.1** as sufficiently recent and solid enough to be considered a major reference - this is also in the spirit of a cross-project cooperation between Food 2030 partners. Sections directly taken from the ENFASYS report are marked in italics.

### Ia Barriers literature review

#### Economic Challenges & Market Dynamics

Several economic challenges exist that influence the operational and organizational efficiency of Living Labs and other food innovators. Examples of such economic barriers is the lack of funding for alternative and sustainable food practices and the influence of market dynamics driven by a food supply chain that favors the production and consumption of highly processed and mass-produced foods at the expense of unprocessed, healthy and sustainable alternatives (Borsellino et al. 2020).

Instead of local farmers selling their output in local markets, farmers are nudged by the market to sell to large, complex and mass-productive food supply chains. This limits the development of local and regional agro-food economies and leads to the loss of positive influence on the food production from the local food markets to an industrial food system that carries both socio-cultural and environmental costs (Blay-Palmer, 2008)

There is a need for multifunctional value chains, representing an alternative to agro-industrial control wherein non-economic qualities of farming and food products are integrated into formal Value Chains ([De Herde et al. 2020](#)).

Regarding the issue of funding that local farmers are facing is the lack of sufficient economic compensation from the government for investing in environmental practices, causing a feeling of inequity in shouldering the additional costs. Financial constraints and the need for monetary incentives to scale up sustainable practices pose challenges to the transformation towards sustainability (Gomes & Reidsma, 2021). Rohe et al. (2022) mention economic challenges in the context of the business model of e.g. farmers being not economically viable in the dominant market environment. This lack of economic viability limits the financial resources that are available for sustainable food companies and initiatives, hindering their ability to attract public funding.

Furthermore, the market dynamics and consumer preferences play a significant role in the shaping of dominating production and consumption patterns. Verburg et al. (2022) highlight the barriers to the adoption of organic products due to the lack of consumer demand. Consumer preferences, such as price sensitivity and willingness to pay, can influence the growth of organic products in the market. This highlights the importance of market demand in driving the adoption of circular economy practices and emphasizes the need for consumer willingness to purchase sustainable products.

## Tacit and Expert Knowledge

Several authors identify knowledge gaps or lack of knowledge as a barrier to Sustainable Food Systems. In the context of systemic factors, knowledge gaps do not refer to lack of knowledge by individuals but rather to the lack of circulation of knowledge within the system.

On top of that, the prevalence of knowledge asymmetries between research and actual food practitioners hinder the co-creative implementation of research-based principles of food innovation practices related to sustainable farming ([Noe et al. 2015](#)).

Verburg et al. (2022) mention barriers in knowledge development and exchange within the context of the Dutch organic dairy sector. The authors highlight the importance of the lack of specialized organic research from agri-food companies and a declining research budget as potential barriers. Hence, resulting knowledge gaps can limit the availability of information and hinders the adoption of sustainable food practices.

## Institutional Inertia & Rigid Policy Processes

Institutional inertia refers to the resistance of institutions to change existing institutional structures and practices. It points to the tendency of institutions to resist more “radical” forms of change and thereby stabilize out-dated and rigid policies that undermine sustainable innovation (Rosenschöld et al 2014)

In the context of food transitions, this can hinder the adoption of sustainable food practices, reflecting the inability of institutions at the EU and member state level to formulate and implement policies steering the transition to sustainable agriculture and food practices ([de Groot 2021](#)). Overcoming institutional inertia is key for fostering both social and technological food innovation.

Living labs and other food innovation actors play an important role in overcoming institutional inertia; the resistance to positive change within existing institutional and economic structures and practices regarding the food system with certain (rigid) policy processes keep this institutional inertia in place. Living Labs aim to foster both institutional and socio-economic innovation through food innovation practices, causing chaos to the dominant food regime and aim to phase-out the old food regime and replace it with the new food regime based on the principles of sustainability and inclusivity.

An example of a practical concept that is going against the dynamics of the dominant food regimes and rigid food policies are civic food networks. This type of *food innovators* network represents a second alternative to the agro-industrial control wherein civil society actors such as citizen-consumers, farmers, and civil society organisations actively create and govern independent food systems. In these networks, state actors play a less prominent role and most power is exercised through bottom-up forms of organisation. Farm products are directly sold to consumers, for instance through farm shops, farmers’ markets, or community-supported agriculture (CSA) schemes in which citizen-consumers play an active role in the management and even production of the food (Hinrichs 2000). Within these socio-economic networks, consumer–producer relationships expand from being purely economic to encompass social and political aspects, such as community and solidarity ([Renting et al. 2012](#)). Ultimately, these food innovation networks can play important roles by connecting different types of stakeholders, providing knowledge, education and community outreach on food innovation, and helping with the lobbying of state actors for policy change ([van Gameren et al. 2015](#)).

An example of such a mechanism are promotion campaigns via Living Labs for e.g. organic food Public food procurement that supports short supply chains and sustainable production (e.g. healthy school meals lunch, see Living Lab Prilep). Hence, Living Labs from the Food 2030 network have the potential to, apart from social and technological innovation, foster institutional innovation and create valuable steps for overcoming institutional inertia.

## Ib Lock-in Literature

### System lock-ins

Kuokkanen et al. (2017) identify a "food system lock-in" that operates at the whole system level. System lock-ins manifest themselves by an interplay with the social, economic, political and environmental domain as a result of globalization and liberalization.

This results in transition lock-ins; the feeling that problems are too big and too complex for solutions ([Wageningen Economic Research 2019](#)). Anderson & Leach (2019) call for systemic and structural approaches and the analysis of power in studying food system change. Their paper mentions the identification and analysis of various lock-ins that prevent societies from transforming food systems, despite the negative consequences to health, quality of life, and ecological integrity.

Williams et. all argue that, for European agri-food systems to overcome lock-ins that are structural in nature and achieve more sustainable food consumption and production modes, we must recognize that European regions are highly diverse, and that we currently lack a thorough understanding of how different regional characteristics may enable or inhibit sustainability transitions. This hinders the development of context-tailored governance strategies ([2024](#)).

### Governance lock-ins

In the case of governance lock-ins, food actors feel stuck due to rigid policy processes hindering the upscaling of their food innovation practices. For farmers, they often have a feeling of powerlessness. The feeling of powerlessness in the chain and the pressure of debt to the bank that farmers have is now leading to path dependencies in which the farmer finds neither motivation nor opportunities for innovation. (Wageningen Economic Research 2019). Hence, supportive institutional environments and food production norms can help provide the necessary resources for frustrated actors to change their practices and build alternative networks ([Blesh et al. 2023](#)).

### Technology and practice lock-ins

This lock-in refers to the self-reinforcing mechanisms that support the dominance of a certain technology or technological practice over time. [Sutherland et al. \(2012\)](#) discuss technological lock-ins in the context of intensive agriculture. Investment in machinery characteristic of intensive agriculture can create a lock-in situation. Farmers who have made significant investments in machinery may be reluctant to convert to organic farming due to the financial loss associated with selling their spraying equipment. This example indirectly suggests the presence of a technology lock-in that hinders the adoption of an alternative, more sustainable technological practice.

## **Economic and Market lock-ins**

Market lock-ins come from the idea of having to produce as cheaply as possible, because consumers are not always prepared to pay for sustainability ([Wageningen Economic Research 2019](#)). This is considered a lock-in, as it is a rigid perception immersed in the evolution of current food systems, driven by a narrow focus on economic efficiency to deliver cheap food at any cost.

A paradigm shift in price perceptions on food is needed; one that moves away from an economically driven food system based on market prices to a food system in which food needs to be of a quality that delivers long-term positive public health outcomes, while improving the economic efficiency of the global food market ([Rushton et al 2021](#))

## **Knowledge and Socio-cultural lock-ins**

For [Sutherland et al. \(2012\)](#) knowledge on farming and food systems by farmers, influenced by practical experience and social food traditions that favor cultural traditions over sustainability factors, can lead to lock-ins in decision-making considering food production and consumption practices of farmers. For example, the decision on specific farming courses by farmers can shape farmers' approaches to food production and limit the consideration of alternative food practices that are both economically and environmentally viable. This knowledge lock-in related to farmer's socio-cultural practices, traditional food narratives and rigid habits can hinder the adoption of sustainable farming practices.

## Annex 2. Focus Group Synopsis documents

### 2.1 FG Meeting: Education & Food (EA)

#### Background

The Erasmus+ Project “Foodshift Pathways” ([www.foodshift-pathways.eu](http://www.foodshift-pathways.eu)), addresses teachers/educational staff, as well as food system actors, raising awareness and cultivating students’ sustainability competences, food literacy and global awareness/citizenship profiles.

#### Participants

- Ioannis Loakeimidis, Karolinska Institute (KI), Stockholm, Sweden (project coordinator)
- Katerina Riviou, Ellinoggermaniki Agogi (EA), Athens, Greece
- Gabriella Perez, Institute for Advanced Architecture in Catalonia (IAAC), Barcelona, Spain
- Ines Almas, Ciencia Viva (CV), Lisbon, Portugal
- Aleksandra Jovanovic & Dirk Wascher, SusMetro (SUS), Tilburg, Netherlands
- Discussion details: please see transcript [here](#)

#### Educational cases: short profile

| Institute | Case Name                           | Value proposition                                                    | Target group                                   | Maturity status           |
|-----------|-------------------------------------|----------------------------------------------------------------------|------------------------------------------------|---------------------------|
| IAAC      | Knowledge & Consumer Choice         | Exhibitions/tools for sharing knowledge to empower consumers         | citizens/consumers - all age groups            | 3 years, SRL 3-5          |
| KI        | Food Advertisement                  | Photo-Apps provide health data for food consumption monitoring       | Young citizens, retail, schools, policy makers | 7 years, TRP 6/7, SRL 5-6 |
| EA        | Food Teaching                       | Teacher training for food literacy and sustainability competences    | Teacher, school organisations, policy makers   | 3 years, SRL 6-7          |
| CV        | Knowledge & Consumer Choice         | Exhibitions/tools for sharing knowledge to empower consumers         | citizens/consumers - all age groups            | 3 years, SRL 3-5          |
| SUS       | Sustainable land use planning (MFP) | Choice of innovative land use alternatives as part of serious gaming | Farmers, students, pupils policy makers        | 6 years, TRL 6/7          |

#### 2.1.1 Barriers and Lock-ins in Food Waste Reduction

In 2010 Catalunya wasted 262,471 tons per year, an equivalent to 7% of all the food purchased. The economic impact of these losses is € 841M per year and € 112 per person per year. The ecological footprint amounts to 234,022 hectares of crops, corresponding with 520,723 tons of greenhouse gases (or 20,300 cars during their useful life). IAAC is supporting and co-developing a range of start-ups focusing on technical innovation for citizens, farmers and consumers.



**Figure A2.1:** barriers & lock-ins from Food Waste Reduction case

### References:

- [Barcelona: The fight against food waste](#)
- [Barcelona Health and Sustainable Food Strategy](#)
- [Article: Supply of organic products in the city of Barcelona](#)
- [Article: Drivers of and Barriers to Organic Purchase Behavior](#)
- [Institute for Advanced Architecture of Catalonia](#)
- <https://blog.iaac.net/colossal-tower-of-a-cyborg-world/>

### 2.1.2 Barriers and Lock-ins in Food Advertisement

Chris van Tulleken in Ultra-Processed People: “You almost never see an ad for beek or mushrooms or milk; and there are no health claims of their packaging. But you do see cartoon characters and vitamin-enriched claims printed all over UPF.” A new study shows that children who live and go to school in less well-off neighbourhoods have far greater exposure to advertising, than their peers in more affluent neighbourhoods. The tools by KI allow monitoring of food choices as well as food ads by children as part of the education..



**Figure A2.2:** barriers & lock-ins from Food Advertisement case

### References:



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

- [Fagerberg et al. 2019: UFP advertisement dominate...](#)
- [EPHA: Towards a childhood free to food advertisement](#)
- [CCC: Junk Food Marketing Restrictions](#)
- [Jager, Wascher & Meijers: Healthy Food is moving up..](#)
- [Living and Food Environment Analysis at Schools](#)

### 2.1.3 Barriers and Lock-ins in Ecological Footprint Assessment

Starting with the yearly food demand of urban populations, the MFP tool calculates the local footprint as hectares required by person. Using a digital table with an interactive GIS model, the tool determines how much agricultural land in the city region is suitable for crops, and how much is not suitable (e.g., protected nature areas, built-up areas, water bodies). Comparing land required for plant-based and animal-based food production, students can apply different innovative land use alternatives to reduce these footprints.



**Figure A2.3:** barriers & lock-ins from Ecological Footprint case

#### References:

- [MFP Examples from the FoodSHIFT2030 project](#)
- [Arciniegas et al. 2022: A participatory tool for assessing land use footprint...](#)
- [Humpenöder et al. 2024: Food matter: Dietary shifts ...](#)
- [The EAST-Lancet Summary Commission Report](#)
- [Battersby & Watson 2019: The planned 'city region'...](#)

### 2.1.4 Barriers and Lock-ins in Teacher Training

According to the Needs Analysis of the Foodshift Pathways project, 83% selected “time restriction” as one of the key barriers that make it (more) difficult to integrate SFS into teaching - followed by “Obligations to other topics” (58% of respondents). At Science Centres, food knowledge and consumer choice issues are moving up on the agenda when reaching out to the wider public and young generations as well.

#### References:

- [Dubbeldam & Wascher, 2023: Needs Analysis in Foodshift Pathways](#)
- [Wascher & Dubbeldam, 2023: Harmonising with European Policies](#)
- [Joint Research Centre 2022: GreenComp report](#)

- [Ellinogermaniki Agogi 2024: Schools as Living Labs](#)
- [SALL – Schools as Living Labs](#)



**Figure A2.4:** barriers & lock-ins from Food Teacher Training case

#### References:

- [Dubbeldam & Wascher, 2023: Needs Analysis in Foodshift Pathways](#)
- [Wascher & Dubbeldam, 2023: Harmonising with European Policies](#)
- [Joint Research Centre 2022: GreenComp report](#)
- [Ellinogermaniki Agogi 2024: Schools as Living Labs](#)
- [SALL – Schools as Living Labs](#)

## 2.2 FG Meeting Food: Technology & data driven lock-in and barriers (WUR)

### Background

Following up on the Food 2030 Networks Conference organized by CLEVERFOOD (5-7 March 2024), Gohar Isakhanyan (WUR) offered to co-organise a Focus Group meeting with researchers from Wageningen that examines two cases in the field of digital and data-driven innovation: (1) food product eco-labelling, and (2) performance assessment systems for retailers and suppliers

### Participants

- **Gohar Isakhanyan**, Data Science & Innovation - Wageningen Economic Research
- **Irina Verweij-Novikova**, Sustainable Value Chains - Wageningen Economic Research
- **Emil Georgiev**, The Sustainability Consortium - WUR
- **Can Atik**, Data Science & Innovation - WUR
- **Kelly Rijswijk**, Transition Risk & Innovation Governance – Wageningen Economic Research
- **Marc Jeroen Borgaardt**, Transition Risk & Innovation Governance – Wageningen Economic Research
- **Jos Verstegen**, Data Science & Innovation - Wageningen Economic Research
- **Gustavo Arciniegas & Dirk Wascher**, SusMetro (SUS), Tilburg, Netherlands

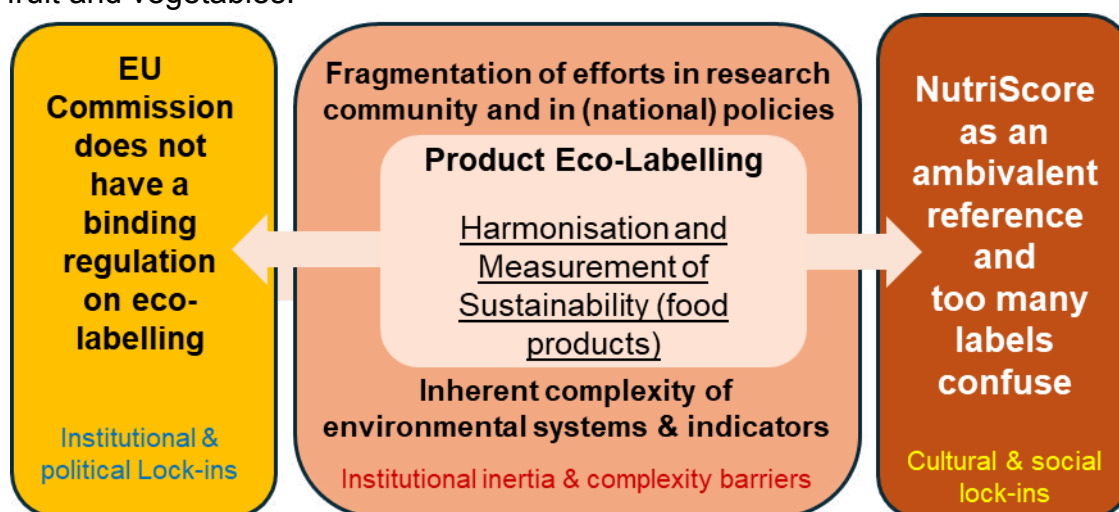
### Educational cases, value propositions, target groups and time & TRL/IRL

| Name | Focus | Value Proposition | Target groups | Maturation |
|------|-------|-------------------|---------------|------------|
|------|-------|-------------------|---------------|------------|

|     |                                        |                                                                                                                                                                                            |                                                                  | status                          |
|-----|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------|
| WUR | Food product eco-labelling             | (1) Makes consumers aware of the impact all food products on the environment; (2) will motivate investors to invest in sustainable food transformation                                     | citizens/consumers, research community, investors, policy makers | 3-5 years<br>TRL 7-8<br>SRL 3-5 |
| WUR | THESIS / The Sustainability Consortium | Sustainability Consortium as a one-stop-shop solution for retailers and suppliers for transforming the consumer goods industry to deliver 141 more sustainable consumer product categories | Suppliers, retail – B2B                                          | 15 years, TRL 6/7               |

### 2.2.1 Barriers and Lock-ins for Eco-labelling

For 81% of their food consumption, consumers cannot rely on one of the top labels for information on how sustainable it is. Because these labels only compare products within a particular product category, they do not help consumers to make purchasing decisions between product categories (e.g. meat versus meat replacer). For the selection between product categories consumers can only count on some general principles such as eating more plant-based food and less animal-based food, and eating locally produced, seasonal fruit and vegetables.



**Figure A2.5:** barriers & lock-ins from Product Eco-labelling case

#### References:

- <https://sustainabilityconsortium.org/thesis/>
- [Product Environmental Footprint \(PEF\)](#)
- [Future Food Institute first study on eco-labelling](#)
- [Article: Boone et al. 2023 LCA-based labelling system – a game changer....](#)
- [The EU Ecolabel – a voluntary scheme](#)
- [Héllas et al. 2022: Implementing environmental labelling of food products in France](#)
- [Van Haaster-de Winter et al 2023: European overview – fact sheet](#)

**Discussion excerpts:** (see transcript [here](#))

Kelly: there is a difference between being a citizen and between being a consumer. As an aware citizen I know that buying meat might not be the smartest choice, but damn do I love meat when I'm a consumer. So I go buy a piece of meat...so I'm a very stupid consumer, yet I'm a very aware citizen, and these things don't match.

Irina: Yes, the way of achieving transparency and self-communication to consumers or within the B2B, but it's not moving fast. There are multiple initiatives that develop, test traffic-like footprint-based labels. Knowing that impact investors require LCA calculations for every innovation they consider seriously, having the ecolabelling introduced widely would potentially also boost the investment into agri-food innovations.

Marc Jeroen: But why should there be a research project for that or why research investment if you formulate the problem in this way?

Irina: going towards Eco-Labeling and harmonisation of methodologies is also worth doing bottom-up via research efforts and projects. Even when not working on food eco-labelling as such but contributing to e.g. improved LCA modelling, facilitation of primary data collection along the value chain, creating awareness on the principles of environmental footprinting is moving collectively towards the goal on harmonisation in approaches even when there is no prescription (policy) on how one must derive an ecolabel.

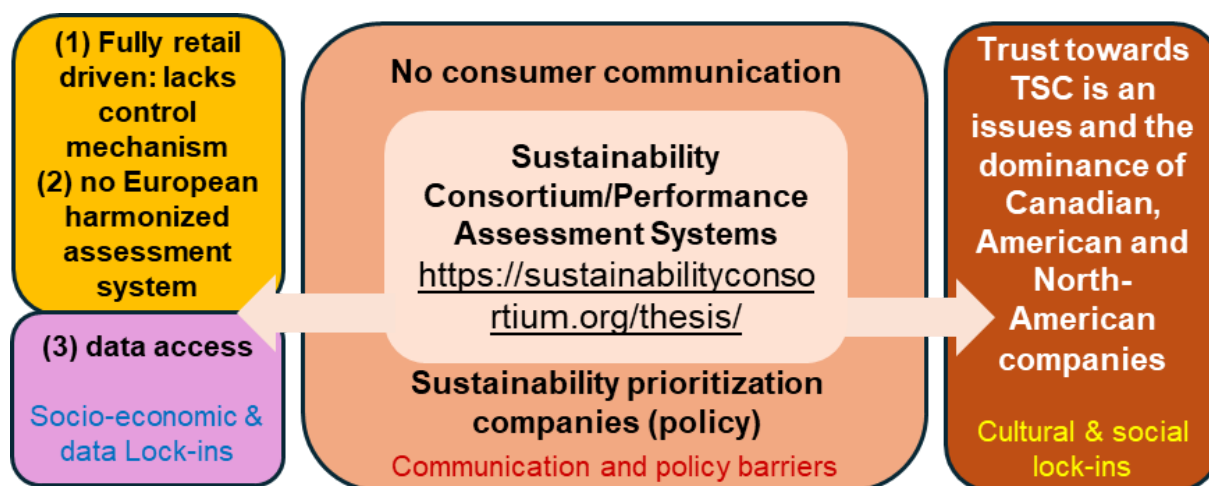
Irina: It takes about €100,000 a year to work closely with the Ministry of Agriculture in the NL and to keep engaging in awareness-raising activities of multiple stakeholders from the sector of agri-food. The on-going project that hosts the Working Group Footprint is a good example: [link to project Harmonizing and measuring sustainability \(food\)](#). In Dutch: [Eerste stappen naar meer transparantie duurzaamheid voedingsmiddelen | Nieuwsbericht | Rijksoverheid.nl](#).

Gustavo: If I got it correctly, LCA data assessment is ahead of social innovation regarding barriers at ministries, EU and people when implementing successfully the eco-labelling?

## **2.2.2 Barriers and Lock-ins for Performance Assessment Systems**

THESIS encounters difficulties in obtaining comparable, high-quality data from suppliers D4F THESIS case study aims to simplify data provision, incentivize suppliers via consumer communication, and assist retailers in prioritization Enhancing THESIS through:

- Databases for LCA Averages - France and the Netherlands offer databases with LCA averages
- Collaboration Private Sector Ecolabel Initiatives - Inoqo, Dayrize, and Sustained empower suppliers in LCA calculations
- Partnerships with these entities enhance sustainability measurement quality



**Figure A2.6:** barriers & lock-ins from Performance Assessment case

### References:

- [Corporate Sustainability Reporting Directive](#)
- [2024 TSC Annual Report](#)
- [Retailers for Sustainability](#)
- [EU Sustainable food processing, wholesale, retail, hospitality and food services](#)
- [Bäumler 2022: The Role of Large Retailers in Scaling Up Sustainable Food Systems Solutions](#)
- [The Future of Food Report \(Australia\)](#)

### Discussion excerpts on both cases:

Gohar: It's better to focus on younger generation if we want to improve the system change, because it's slightly, in all respects, slightly the older generation which dominates the discussion: we are actually locked in the way we are raised, we are locked in the way we think, we are locked in the way we eat and consume and sleep. The younger generation is still ready to change.

Gustavo: So are you saying there's a barrier of literacy or maybe a generational shift?

Gohar: yes

Marc Jeroen: involving young farmers will not work if just working from 9 to 5 and not on weekends. But also that they have a different cultural lifestyle and another opinion about work life.

Jos: if you offer a more efficient system, that system will also help you in your wallet. But if you go every week and it's a routine - you don't look at the nutrient norms. And especially if you don't bother how precise it is.

Can: I agree with the generational perspective. But still, even in the newer generation, I think social economic effects are also important, Especially if these labeled products are more expensive, then I mean lower socio-economic groups will go for the no-label options.

## 2.3 FG Meeting: Citizen platform (IrsiCaixa)

### Background



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Alison is a multi-stakeholder innovation network promoting healthy and Sustainable food, initiated by the Barcelona CaixaResearch Living Lab with support from the "la Caixa" Foundation and Barcelona City Council, and coordinated by the Living Lab for Health at IrsiCaixa. Launched under the European project FIT4Food 2030, Alison aims to innovate in promoting healthy, sustainable food in Barcelona through a systemic, collaborative, and decentralized approach.

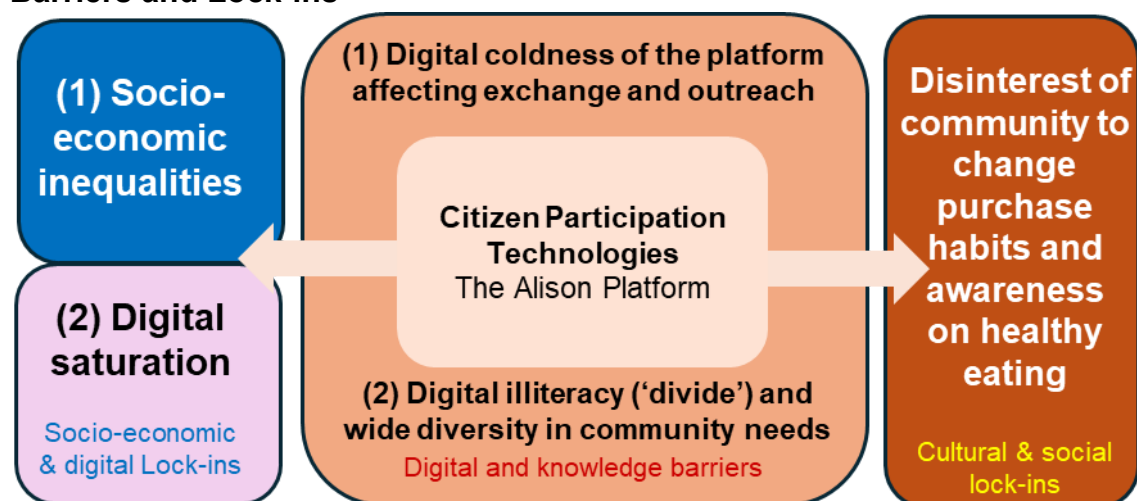
### Participants

- Ricard Faura, Generalitat de Catalunya, Spain
- Rafael Nualart, i2Cat, Barcelona, Spain
- Valeria Coopera, La Botiga, Spain
- Carme Gual & Oriol Costa, Ecoregió, Barcelona, Spain
- Laura Bosch & Victor Tenez, FoodCoop / AMB, Barcelona, Spain
- Marina Pino & Rosina Malagrida, IrsiCaixa (IRSI), Badalona, Spain
- Gustavo Arciniegas & Dirk Wascher, SusMetro (SUS), Tilburg, Netherlands

### Citizen participation technology case: short profile

| Name                    | Focus                              | Value Proposition                                                                                                                                                                    | Target groups                                                   | Maturation status |
|-------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------|
| <b>Allison Platform</b> | Citizen Participation Technologies | A digital web-based platform to digitalize the promotion of healthy and sustainable food through a systemic, collaborative and decentralized innovation network: The Alison Network. | Citizens, volunteers, professionals, policy makers, communities | 3 years, TRL 5-6  |

### Barriers and Lock-ins



**Figure A2.7:** barriers & lock-ins from the citizen digital participation case

### Discussion excerpts: (see summary transcript [here](#))

IrsiCaixa saw a need for a digital tool or a webpage to accompany a food transition process where reflections on this process occur continuously, because they are aware of the high complexity of the food system. Moreover, all the solutions they implement in a neighborhood must be constantly adapting to changes, such as community preferences and food perspectives and can be inspired by changes being implemented in other localities.

Oriol Costa (Ecoregió) commented on the digital divide, as there is a very significant and suddenly increased change in the use of internet tools post Covid. We have all digitized suddenly, but there is still a very, very big digital gap. They see that for communities in Catalunya the digital tool that works better for communities is still WhatsApp or Telegram. Laura Bosch (AMB Barcelona) on digital saturation: “We are in an environment with a great multiplicity of channels, many messages, a lot of information or “infoxication”. So, there is a lot of competition for attention in the virtual environment and I think that does not make it easy to develop and promote a tool such as the Alison Platform.

## 2.4. FG Meeting: Innovative crop production in marginal areas for biomass production in a circular economy (AKI)

### Background

The **MarginUp!** project is developing sustainable and circular value chains to produce bioproducts from natural raw materials grown on marginal lands. By introducing climate resilient and biodiversity-friendly non-food crops on marginal and low-productivity lands, **MarginUp!** will increase farming system resilience, enhance biodiversity, and promote stakeholder participation. This FG meeting revolves around the cultivation of herbaceous (*Sida hermaphrodita* – Virginia mallow) and woody (energy willow) crops, which can be used as the substrate of oyster mushrooms. After harvesting the mushrooms, the spent substrate is used as a feedstock for livestock and as soil conditioner and is also processed in a biogas plant to produce energy. The digestate from the biogas plant is also returned to the land as a soil conditioner.

### Participants

- **Barbara Pápai**, Innomine Digital Innovation Hub Non-profit Ltd
- **Ákos Koós and Nóra Hatvani**, Bay Zoltán Nonprofit Ltd
- **Katalin Kujáni**, Kujáni Farm
- **Klára Kitajka**, Pilze-Nagy Ltd.
- **Livia Kránitz**, Group leader, AKI, Innovation and Digitalisation Support Group
- **Gustavo Arciniegas**, Susmetro (SUS), Tilburg, Netherlands - CLEVERFOOD
- **Valeria Csonka**, ÖMKi - Hungarian consortium member (ÖMKi) of CLEVERFOOD
- **Anett Gundel-Fekete**, AKI - consortium member of Cleverfood - note taking
- **Judit Hátori**, AKI: Chairing and moderation of FG

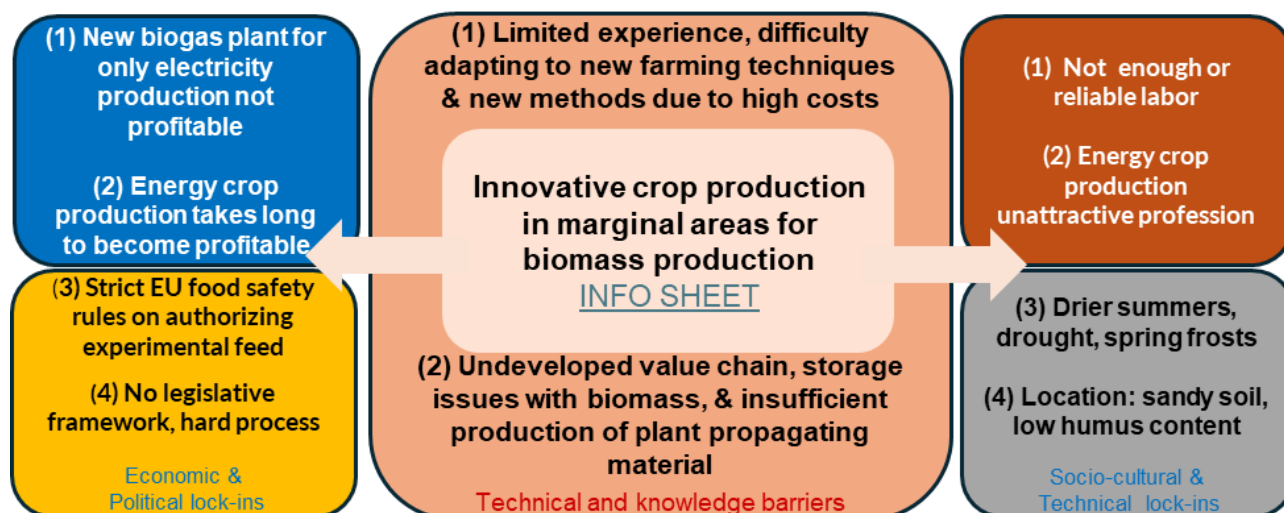
### Citizen participation technology case: short profile



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| Name                                                                                      | Focus                              | Value Propositions                                                                                                                                                                                                    | Target groups                                                                                | Progress                                                                                                                       |
|-------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Innovative crop production in marginal areas for biomass production in a circular economy | Food supply chain, Food innovation | (1) Sustainable use of marginal lands in a circular economy (policy, research value proposition)<br>(2) Use of alternative biomass crops in areas severely affected by climate change (value proposition for farmers) | Farmers (growers), oyster mushroom producers, biogas plants, energy sector, livestock farms. | In year 2<br>TRL 9 (Biogas production from spent substrate)<br>TRL 3 (Use of spent substrate as animal feed)<br>SRL 5<br>IRL 4 |

## Barriers and Lock-ins



**Figure A2.8:** barriers & lock-ins from the marginal farming case

## Discussion excerpts: (see summary transcript [here](#))

### 1. Environmental Barriers to Cultivation

**Kujáni Farm:** "Climate change and geographical location ('sandy soli, quicksand') are among the main lock-in factors. [...] *Sida hermaphrodita* is very good, but energy willow is not good in sandy, droughty areas." **Comment:** Environmental conditions such as drought and low soil humus content severely limit crop viability, requiring careful selection of resilient plants.

### 2. Storage Issues for Biomass Projects

**Bay Zoltán Nonprofit Ltd:** "Biomass storage is an obstacle in any project of this kind. It is useless to have an elaborated utilization option if biomass raw material does not reach that point as an input material in a suitable form, because it will mildew or rot." **Comment:** High-moisture biomass requires innovative storage solutions to prevent spoilage and maintain utility.

### 3. Market and Policy Challenges

**Kujáni Farm:** "Now there is no market, there is nowhere to sell it, thus there is just curiosity, and superficial interest from the farmers."

**Kujáni Farm:** "The regulatory framework has been a struggle for several years. [...] Growing food/non-food plants is no longer just a policy issue but a political one." **Comment:** The lack of a developed value chain and supportive policies impedes farmer interest and the scalability of projects.

### 4. Labour Shortages in Agriculture

**Kujáni Farm:** "There is not enough labour and what we have is not reliable. [...] Illiterate workers can be employed for agricultural work, but they can also cause damage." Comment: Labour scarcity and low reliability are significant hurdles, prompting mechanization as a solution.

## 5. Potential in Cooperative Models and Living Labs

**Kujáni Farm:** "A well-functioning cooperative could help the investments [...] This is working in Bolzano, with the apple growers in South Tyrol. It doesn't work here, or it's very rare." Comment: Collaborative models have potential but require structural and cultural changes to succeed in Hungary.

## 2.5 FG Meeting: From Farm to Table for Greener Meals: Technological and Social 'Lock-ins' and Barriers (SEGES)

### Background

This FG meeting addressed key challenges in promoting local Danish produce, specifically nuts and legumes, in the face of market and cultural barriers. Despite a preference for local produce, Danish nuts face high production costs, requiring significant investments in e.g. plant material, machinery & equipment, limiting their market presence. Similarly, while climate-friendly dietary guidelines advocate for increased consumption of local legumes, consumer habits still favor imported varieties like soy and kidney beans. The meeting explored economic and cultural lock-ins, the underdeveloped value chain, and the necessary stakeholder collaboration between farmers, industry representatives, researchers, and retailers, to overcome these barriers.

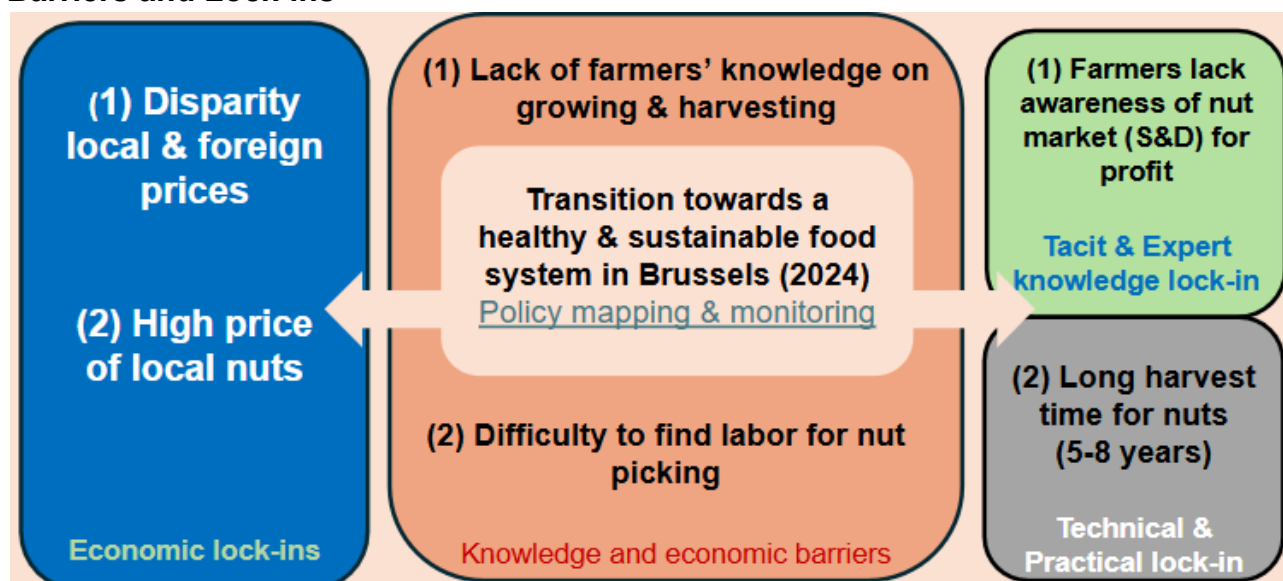
### Participants

- **Lærke Kirstine Lund:** Sector Manager for Plants and Plant-based Foods
- **Nina La Cour:** Project Manager, CSR, Lidl
- **Jacob Dam Nielsen:** Plant and Organic Advisor, VKST Plant Cultivation and Foods Bornholm
- **Anton Storgaard:** Product Consultant for Organic Products, Hornsyld Købmandsgaard
- **Maja Skaaning:** Project Leader and Project Manager Trading, DLG
- **Gustavo Arciniegas,** Susmetro, CLEVERFOOD
- **Christine Thomsen, Benita Hyldgaard, Liva Wisborg Boll,** SEGES Innovation

### Case 1. Nuts with Danish roots

| Name                                  | Focus                                                                                   | Value Proposition                                                                                                                                                                                                                                                            | Target groups                                                   | Progress                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------|
| <b>CASE 1: Nuts with Danish Roots</b> | <b>Production &amp; consumption of Danish nuts, Food procurement, Food supply chain</b> | (1) Endorse Danish nuts as a healthy financially viable alternative for imported nuts<br>(2) Creation of mechanisms for training farmers about nut production<br>(3) Promote the benefits of Danish nut consumption<br>(4) Creating a farmer-friendly market for Danish nuts | Restaurant industry, Climate & agroforestry, Farmers, Consumers | TRL: 3-5<br>Expect to develop more within 5-10 years |

## Barriers and Lock-ins



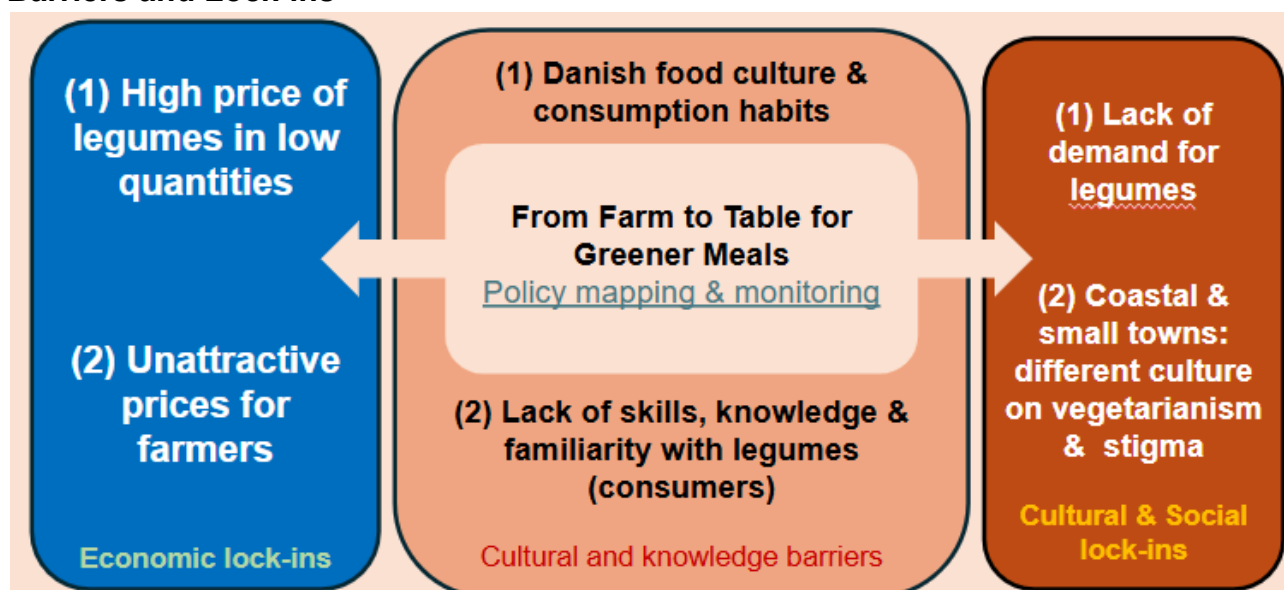
## Main takeaways - Potential solutions recommended by the FG participants

- **Restaurant Industry:** Nuts are considered a luxury item, and therefore restaurants are an important target group for nuts, because of the frequent willingness to pay higher prices for quality products. A Corporate Social Responsibility (CSR) project could also be relevant.
- **Climate and Agroforestry:** Nuts fit well into climate and agroforestry, especially considering time horizons. It is important to make farmers interested in how nuts should be planted and harvested.
- **Nut Bushes in Chicken Yards:** Especially hazelnuts can be planted in chicken yards, as chickens do not build nests in these bushes, and they provide cover from predators. This has good potential.
- **Nut Plantations as Forests:** It is worth investigating whether nut plantations can count as forests, which could make them an interesting alternative.
- **Areas on Farms,** which could be used to plant nuts. In organic farming, there are subsidies for fruit and berry production. Once the areas are established, the focus can shift to transitioning to organic farming later. Farmers' areas that are not suitable for efficient agricultural production could be used for nut production. If these areas are suitable for nut production, farmers could receive subsidies to plant nut bushes or trees. After a few years, when the nuts need to be harvested, effective harvesting methods can be found.
- **Shelterbelts:** Especially on Lolland, there are shelterbelts with various fruits and berries, but not nuts. It could be an idea to plant more shelterbelts or replant existing ones so that nuts can be included in the guidelines. This would be a way to get nuts into production.

## Case 2. More Danish legumes on the plate

|                                                 |                                                                                                              |                                                                                                                                                                                                               |                                              |                                                     |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|
| <b>CASE 2: More Danish Legumes on the Plate</b> | <b>Production &amp; consumption of Danish legumes, Food procurement, Food supply chain, Behaviour change</b> | (1) Promote Danish legumes and the benefits of their consumption<br>(2) Creation of a food supply chain and a market for Danish legumes<br>(3) Increase awareness of the benefits of consuming Danish legumes | Consumers, Farmers<br>Food service<br>Retail | TRL: 5-7<br>Expect to develop more within 2-5 years |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|

## Barriers and Lock-ins



## Discussion excerpts

### Main takeaways - Potential solutions recommended by the FG participants

- **Get consumers to taste legumes from other sources:** The first step in cultural change is getting consumers to taste legumes from new sources before they incorporate them into daily use. Increased focus on introducing legumes through canteens and public dining is key. Wholesalers, food services, canteens in public workplaces, and public kitchens, like those in hospitals, play a crucial role in driving this change.
- **'Nudge' consumers to buy legumes:** Adjusting supermarket layouts, as Lidl is testing with CBS by moving legumes to the fruit and vegetable section to inspire small behavior shifts without large campaigns. Incorporating legumes into familiar products (bread & ready meals, where industry giants like Kohberg & Schulstad could lead by example, as legumes can improve shelf life and reduce waste. Naming conventions for legumes, especially peas, also impact consumer perception; there is debate over using general names or specific variety names, which could influence the flexibility of introducing improved legume varieties.
- **General information and "Education" on legumes:** Promoting legume use requires consumer education, including recipe ideas and creating simple "hero dishes" that showcase legumes. Highlighting complementary dishes can also help integrate legumes into everyday meals. Beyond providing knowledge, collaboration between diverse stakeholders and exploring new ways to use legumes are key. Hosting tastings and learning sessions can effectively introduce consumers to legumes and demonstrate their versatility in various dishes.

### Additional important factors

- **The Value Chain - Farmers are not a challenge:** Legume cultivation requires attractive prices for farmers, with collaboration across the value chain to ensure suitable crops, steady sales, and alignment with Danish climate conditions.
- **Climate Accounting:** Climate data for legumes is crucial, addressing both consumer climate footprint concerns and the impact on farmers' climate accounts.

## 2.6 FG Meeting: Local food policy implementation - Cork's perspective (CORK Municipality)

### Background

The strategy behind the policy is developing the framework to integrate the topics of food, health & social wellbeing, climate impact and biodiversity and food education. The Living Lab's focus on food system innovation is on stimulating the positive transition of Cork's local food system by raising awareness on the important role of local food and healthy diets. Through the close collaboration with The Cork Food Policy Council (2014) and Cork's City Council, the complementary second delivery is to develop a Sustainable Food Hub to provide organic farmers with access to land, infrastructure, facilities and educational resources. The Food Hub focuses on three broad themes, which are going to feed the content of the upcoming Cork Food policy (2025):

1. Barriers to promoting sustainable environments
2. Facilitators in promoting sustainable environments

The role of local government in promoting sustainable environments

### Participants

- **Nora Lorenzo**, Sciensano Isabel Martinho da Silva, docent LARC (University of Porto)
- **Heloisa Amaral Antunes**, Assistant Professor (University of Porto)
- **Sara Moreira**, professor Urban Planning and Environment
- **Denise Cahill, Stephen Murphy** Cork Food Policy Council
- **Sara Cruz**, University of Porto
- **Anna Maria Murante**, Sant'Anna
- **Catalina Leon Gonzalez**, Sant'anna Pisa
- **Mafalda Brandao and Catarina Prado**, local food Porto
- **Andreia Saavedra**, CIBIO Daniel Boris (PhD candidate CITTA under Andreia)
- **Marta and Cristina**, OpenDot
- **Anant Jani**, Coordinator FEAST project
- **Susana Campos**, IPVC Alto Minho) & Luisa Garcia (CIM Alto Minho) - online
- **Dirk Wascher, Gustavo Arcienegas & Aleksandra Jovanovic**, SusMetro, Tilburg

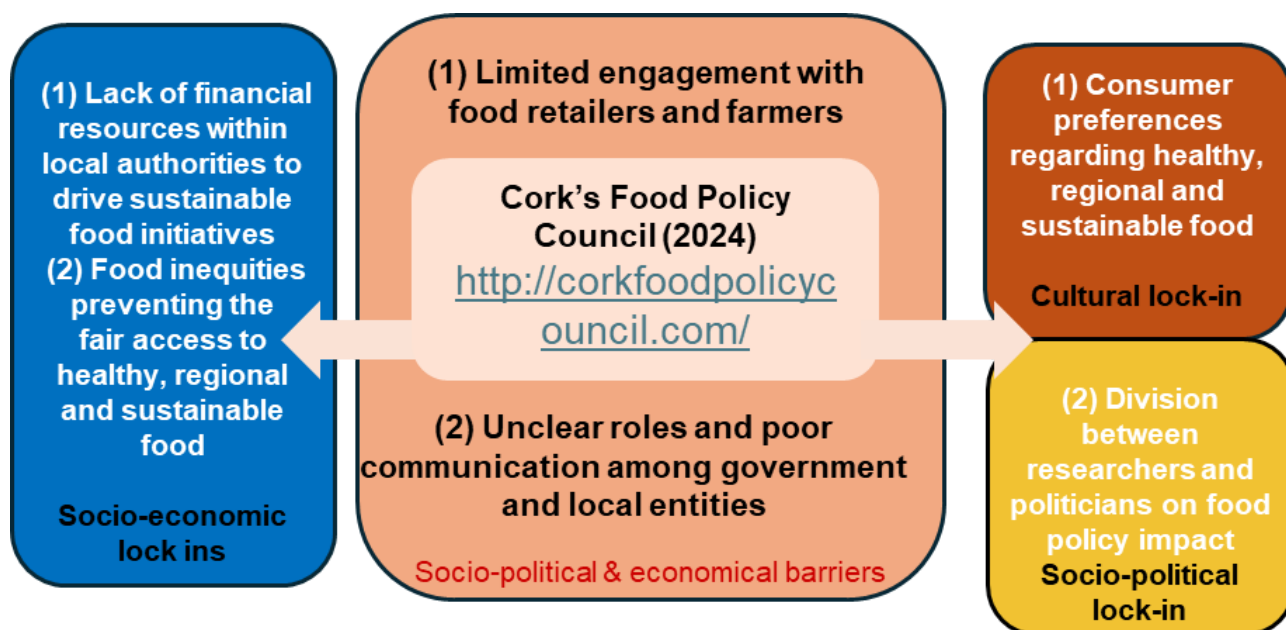
### Cork food strategy case: short profile

| Name                                 | Focus                                                                                                                                       | Value Proposition                                                                                                                                                                                                                                                            | Target groups                         | Progress        |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------|
| <b>FEAST<br/>Cork Living<br/>Lab</b> | <b>Citizen<br/>Participation,<br/>Food Policy<br/>Support &amp;<br/>Impact, Food<br/>education,<br/>Food<br/>procurement<br/>activities</b> | (1) Food community activities for citizen participation, (2) raising awareness (3) local food policy implementation, (4) creation of a healthy food environment, (5) sustainable food behaviour nudging, (6) local economy strengthening: increasing organic food production | citizens/consumers, schools, farmers, | 1 year<br>SRL 5 |

### Barriers and Lock-ins



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**Figure A2.11:**

**Discussion excerpts: (see summary transcript )**

- An important enabler for political food innovation is Living Lab (LL) Cork's **collaborative efforts with local policy-makers and the public sector**;
- LL Cork being a **policy lab**, policy-makers have been involved directly from the beginning of the two main Living Lab activities: 1) The strategic development of Cork's Food Policy (2025) and 2) The creation of a Food Hub that will connect local producers (e.g. farmers) with local demand. Regarding the latter, partnerships with Public Sector Bodies (e.g. hospitals) can act as an economic facilitator to determine the local food demand of such actors and develop a solid customer base.
- Another enabler is that policy-makers work alongside practitioners, researchers and other stakeholders to co-create solutions for the development of Cork's food policy. An example of such a collaborative effort is the **mapping of local policies by the Cork Food Policy Council, which are influencing healthy diets from sustainable food systems at local city level**.
- In terms of output, the mapped policies are categorized based on 33 proposed policy index indicators that reflect the current status of policy (programs) on e.g. 1) sustainable land use management and 2) support for sustainable agri-food practices
- In the light of corporate social responsibility and the urgency of environmental policy integration, the **current momentum on the environmental and economic performance of food supply management businesses and political organizations** acts as another **facilitator in the political domain (Wagner 2015)**
- The food policy efforts of Living Lab Cork run parallel with the Cork City Council's commitment to carbon neutrality by 2030. This reveals a commitment paired with an urgency for local action to address the current unsustainable food practices driven by national policy in Ireland with local action to help to improve the situation. Therefore, strengthening the collaboration among diverse stakeholders, such as the Cork Food Policy Council and Climate Neutral Cork Leadership Group can work as an enabler for greater commitment from local authorities, including biodiversity officers and climate action teams to recognize and link these current efforts for **the shaping of healthy and sustainable food environments**.

- **The role of researchers to create impact in the science-policy interface:** food innovation researchers can facilitate this impact by supporting LL activities by doing sustainability impact assessment in terms of social, environmental and economic effects of these LL activities. This scientific output can then be used as evidence-based research for the shaping of new policies. The potential of this evidence-based research is to improve the science-policy interface of Cork's current efforts on topics such as 1) soil health and quality of Cork's community gardens, 2) the role of community gardens for improving social/mental well-being, 3) the role of healthy and sustainable in food in improving biodiversity and mitigating climate change.
- In terms of reaching wider community involvement and creating movement in their so called "policy-community action loop", LL Cork is focusing on the organization of **public consultations with the citizens** of Cork on what a 'A Resilient and Local Food System for Cork' might look like. This gives opportunities for wider voices to be heard, creating more diversity in terms of societal stakeholders and, in line with inclusivity, ensuring that the aspirations of these diverse stakeholders can be brought into the policy plans.

## 2.7 FG Meeting: Local food policy implementation - Brussels' perspective (Ghent)

### Background

Sciensano is a research partner within the FEAST project, conducting Living-Lab-related research on boosting the adoption of food and health policy interventions to drive the transition to healthy and more sustainable diets in Brussels (2024). Part of these efforts include co-design and scientific testing of communication strategies associated with food policy mapping and monitoring approaches that could be useful for policy making. The mapping and monitoring process involved four major steps:

- 1) Food Policy Mapping
- 2) Informal discussions to ensure coverage of relevant political issues and perspectives on food, health and sustainability
- 3) Stakeholder interviews with local policymakers, food provision representative and the community
- 4) Identifying barriers and facilitators for the implementation of sustainable and healthy food policies

### Participants

- **Nora Lorenzo**, Sciensano Isabel Martinho da Silva, docent LARC (University of Porto)
- **Heloisa Amaral Antunes**, Assistant Professor (University of Porto)
- **Sara Moreira**, professor Urban Planning and Environment
- **Denise Cahill, Stephen Murphy** Cork Food Policy Council
- **Sara Cruz**, University of Porto
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- **Dirk Wascher, Gustavo Arcienegas & Aleksandra Jovanovic**, SusMetro, Tilburg



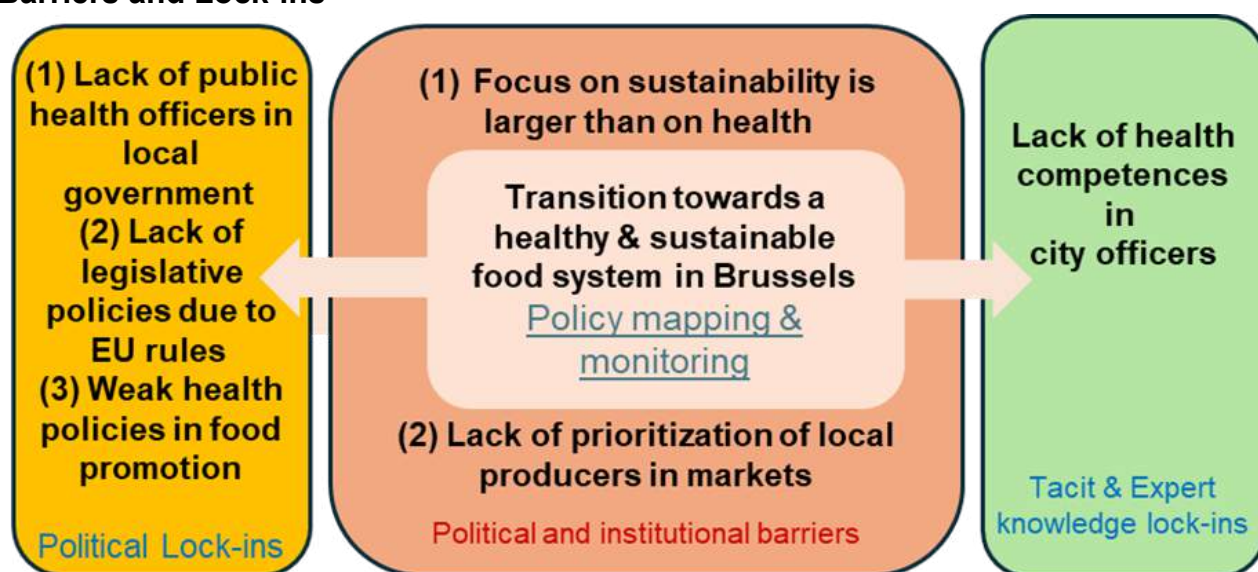
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## Brussels City's case:

*Towards a healthy and more sustainable food system in Brussels city: identifying barriers and facilitators at local level (Nora Lorenzo, Sciensano), value propositions, target groups & SRL*

| Name                                    | Focus                                                                                                                                | Value Proposition                                                                                                                                                                                                                                                         | Target groups                                     | Progress        |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------|
| <b>FEAST<br/>Brussel<br/>Living Lab</b> | <b>Food Policy Support &amp; Impact, Healthy food, Food procurement activities, Food supply chain, Food environ. Social policies</b> | (1) Provision of healthier and more sustainable food services to schools, hospital, kingdom gardens.<br>(2) Local food policy implementation<br>(3) Creation of a healthy food environment<br>(4) Healthy food behaviour nudging<br>(5) Awareness raising on healthy food | City officers, citizens, consumers, local farmers | 1 year<br>SRL 5 |

## Barriers and Lock-ins



**Figure A2.12**

## Discussion excerpts: (see summary transcript )

**Daniel Boris:** "The biggest problem is the implementation of policies. It's a complex network of concepts that small producers have to understand, making it a long process. The biggest barrier I see is the lack of professionals to support those who need it most."

**Nora Lorenzo:** "In Brussels, they offered subsidies for small farmers, but none were getting them due to bureaucracy. They brought in an external association to help, and since then, it's been much more effective."

**Dirk Wascher:** "Does a living lab need to recruit staff like lawyers or advisors to assist these groups? So far, we've been coming purely from a scientific background, but practical support seems necessary."

**Stephen Murphy:** "We started working with a small-scale farmer who explained how he could access funding from national or European sources, but realized we couldn't meet the criteria. It's crucial to have someone who can guide us towards the right funding path."

**Denise Cahill:** "The key is establishing networks and inter-community grids where knowledge is shared. It's about creating common rules and sharing past experiences to form strong, supportive networks."

## 2.8 FG Meeting: Digital technology innovation in grazed beef cattle farming (ÖMKI)

### Background

In Hungary, since 2020, an **8% decrease in the beef cattle population** has largely been driven by the **COVID-19 pandemic, summer droughts, severe labour shortages and the sharp rise in production costs**. These impacts affecting fodder production underscore the need to more effectively monitor the efficient use of resources. In beef cattle farming, the foundation of profitability is grazing and to keep the animals on the pasture for as long as possible without overgrazing nor undergrazing on the fields. However, in free-range animal husbandry – adapted to the natural needs of the animals and to specific grazing regimes as required in the case of Natura 2000 areas – continuous monitoring is difficult. Recently, innovative digital technology, such as invasive sensors and transceivers with the necessary range, offer new opportunities.

Part of a [PATH2DEA](#) project full-day event, the focus group discussions explored the difficulties and barriers encountered during the innovation process in the field of free-range cattle monitoring, focusing on neck transponders used to collect animal welfare data (indicators of animal health problems, behaviour and estrus detection).

### Participants

- **Barbara Babay-Török** – ÖMKi researcher, animal husbandry group
- **Judit Kiss** – Distribution company
- **Diána Kovács** – farmer, ÖMKi partner
- **Daniel Kackó** – farmer, ÖMKi partner
- **Dániel Bori** – ÖMKi researcher, Agro IT group
- **Valéria Csonka** – ÖMKi researcher (facilitator)

### The ÖMKI case:

*Barriers & facilitators to make use of digital tools such as non-invasive sensors and transceivers for monitoring animal welfare data for free-ranging cattle for the efficient use of resources.*

| Name                              | Focus                                                                        | Value Proposition                                                                                                                                            | Target groups                                                                               | Progress                         |
|-----------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------|
| <b>CLEVERFOOD</b><br>partner ÖMKi | <b>Digital monitoring devices (neck transponder) for grazing beef cattle</b> | Increase animal welfare, reduce labour shortages, make better use of existing resources, improve quality, better use and protection of Natura 2000 grassland | Grazing beef farms, restaurants and consumers, sensor distributors and developers/producers | <b>TRL7 -<br/>SRL6<br/>IRL 7</b> |

## Barriers and Lock-ins

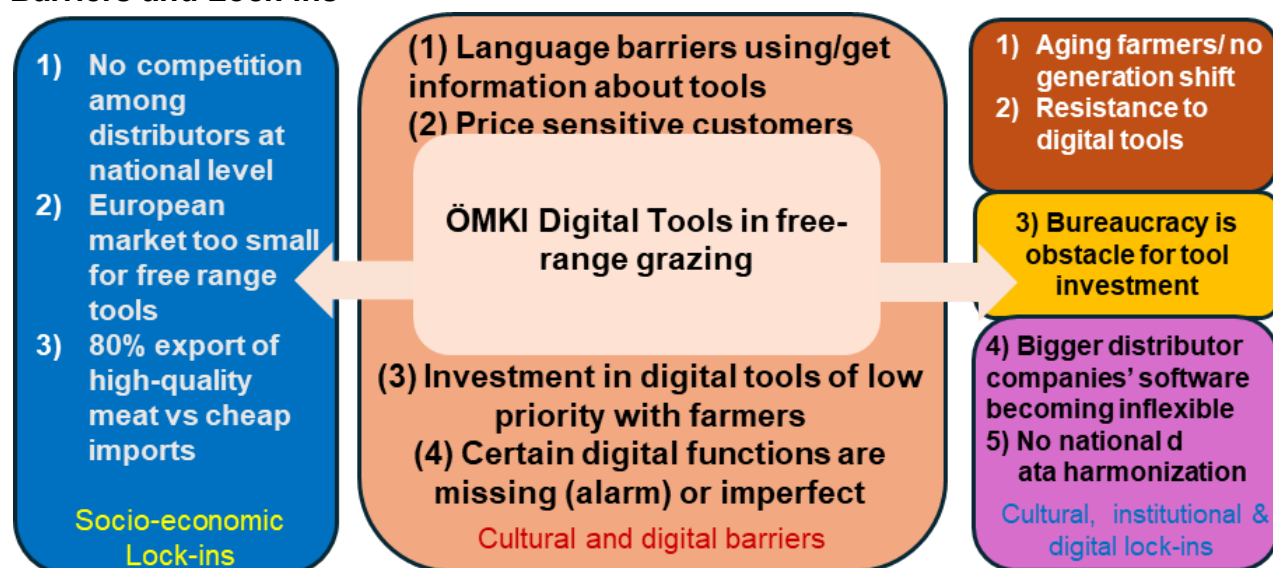


Figure A2.13

## Discussion excerpts: (see summary transcript )

### Economic driving forces

Distributors: the time for big exhibitions is over. It is **difficult to reach farmers** through these channels, as there are few professional programmes at national events. There are few markets and **distributors** in the country, so they are **not forced to compete** with each other.

The Farmer: smaller trade events can have a greater impact, but in many cases the products promoted by companies can only be seen online or at international exhibitions.

Researcher: In our investigations, we observed that smaller farms, due to market exposure (fluctuating feed prices, animal sales), the narrowing of domestic sales chains), are **hesitant to invest in innovative technologies**. They **struggle to secure the necessary financial resources for investment** on their own, as they lack access to favourable loan structures from banks and, in many cases, the professional support needed to implement new technologies from distributor companies is also missing.

### Cultural disposition

Hungarian society is **highly price-sensitive** and **beef consumption is not popular**, partly because of its price and partly because of its availability. Generational change is a significant issue in Hungarian agriculture. More of the young people are open to new technologies, but this does not replace professional knowledge and experience. A combination of these is essential to fully leverage the potential of digital tools in everyday farming.

### Policy processes

Pasture-based livestock farming significantly contributes to sustainable production, as animals graze on lands that are less suitable or unsuitable for other forms of agricultural use. Therefore, grazing animals should not only be regarded as a source of food but also as a technological asset that helps maintain the cultural state of grasslands and enhances the carbon sequestration capacity of these areas. In this context, it is essential to support investments in new digital technologies at the policy level, which assist grazing livestock farmers in utilizing their resources more efficiently and sustaining viable long-term operations.

### Retail and supply chain

The **European market is relatively small**. In the US, there are good technologies, but they are difficult to access and adapt to our own environment. Price and domestic availability are also greatly influenced by the fact that **80% of the animals from beef cattle farms are exported** as live animals and the beef available in domestic shops is not of such high quality and comes from abroad.

### Know-how and organisation

•Researcher: in the beginning of the innovation process, the stability of the data flow was a challenge. By placing a mobile transceiver on the platform, it was possible to ensure a steady flow of data.

•Farmer: Even if the transponder measures the data, it would also be necessary to have an alarm system that automatically alerts on the signal. One of the difficulties is the **high number of false alarms**, but they are still at the beginning of the process, as they have only had the sensors since April. Another complication if the **transponder falls off the animals**, gets damaged (horns get stuck etc..) which also leads to false alarms or incorrect data. If the tools could work perfectly, it would be possible to replace the workforce, but this would require much more attention and effort on the part of the farmer during the testing period and adaptation to local conditions.

**Currently, certain functions are missing, which could help reduce the workforce.** For example, the forecasting of calving. It would be important to provide immediate feedback and alerts to the farmer based on the measured data.

## 2.9 FG Meeting: Agropark Tuinen van Stene, Oostende (City of Oostende)

### Background

Oostend's focus on food system transition is on stimulating the local food dynamics and raising awareness on 'local food and healthy diet' by developing a food strategy and leveraging the newly developed agricultural park 'Gardens of Stene'. The part is seeking to integrate food, health, biodiversity, recreation, education and co-housing – which means that many different stakeholders are involved.

### Participants

- **Bram Secru**, Co-Housing Boldershof
- **Joke Coopman**, Buitengoed & Biopluktuin
- **Stefaan Michiels**, Dairy farmer
- **Hannah Herreman**, vzw Duinhelm
- **Jo Huygh, Duss Explorers** in commission of Piet Colruyt
- **Paul Lingier**, Natuurpunt vzw
- **Eli Devriendt**, city of Oostende, landscape architect
- **Jan Dhont**, city of Oostende, neighborhood services
- **Kathy Belpaeme**, city of Oostende, policy coordinator food strategy
- **Dirk Wascher**, SusMetro, SusMetro

## Educational cases, value propositions, target groups and time & TRL/IRL

| Name                    | Focus                                          | Value Proposition                                                                                                                                                                            | Target groups                                                        | Progress                      |
|-------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------|
| <b>City of Oostende</b> | Coordination, strategic plan-ning facilitation | (1) Practical solutions for citizen participation, (2) net-working, e.g. yearly Food Forum, (3) raising awareness (4) education (5) accessibility/recreation/landscape                       | citizens/consumers, schools, regional tourists,                      | 5 years<br>TRL 5-6<br>SRL 6-7 |
| <b>Buitengoed</b>       | Site manage-ment, education, production,       | (1) Organic food production, (2) community harvesting (Biopluktuin), (2) cooperation with farmers, (3) food forest implementation (4) renovation and maintenance                             | citizens/consumers, schools, farmers, tourists, children             | 5 years<br>TRL 5-6<br>SRL 6-7 |
| <b>Duinhelm</b>         | Social, psych-therapeu tic support             | (1) hands-on activities with people with special needs, (2) integration of vulnerable people into neighbourhood and everyday life, (3) therapy                                               | Vulnerable groups/people with an impediment (physical and/or mental) | 5 years<br>TRL 5-6<br>SRL 6-7 |
| <b>Co-housing</b>       | Social living, neighbourhood , help, education | (1) Offering wider infrastructure for agropark users, (2) green infrastructure, (3) social space, (4) home teaching for own children                                                         | Wide range of park users and neighbours, citizens                    | 5 years<br>TRL 5-6<br>SRL 6-7 |
| <b>Duss Explorers</b>   | Project development, architecture              | (1) Architectural integration of adjacent and park-bound development, (2) offer or space services for social activities and Buitengoed, (3) wider planning vision (4) co-housing development | Citizens, entrepreneurs, city of Oostende,                           | 5 years<br>TRL 8-9<br>SRL 6-7 |
| <b>Natuurpunt</b>       | Nature conservation,e ducation, monitoring     | (1) Avoid further expansion of the city, (2) protect & integrate habitats and species, (3) compensation and new nature (4) education, (5) monitoring of nature values.                       | People & nature, city of Oostende,                                   | 5 years<br>TRL 8-9<br>SRL 4-5 |
| <b>Farmer</b>           | Livestock (milk & feed production)             | (1) Food production, (2) sales of milk                                                                                                                                                       | customers                                                            | 5 years<br>TRL 8-9<br>SRL 2-3 |

**Disclaimer:** this meeting did not follow the standard protocol of the FG Meetings as participants – especially the City – was considering the event as a good opportunity for touching base with a number of stakeholders with whom they had not been in contact with for some time. As a consequence, the exploration of barriers vs. lock-ins did not get the same space; we also avoided some of the technical jargon as the meeting was largely chaired in Dutch by city employee Kathy who put emphasis of keeping the meeting low-threshold. As agreed before the meeting, Kathy put of forward a rather informal agenda which was structured according to the different phases of the agropark development, namely past (establishment) – current (running it) – future (expansion). The discussion was also more focussing on naming the solutions and less the reasons behind barriers and lock-ins. Minutes have been provided largely by Kathy with input by Dirk.

### **Findings on past barriers: (see transcript [here](#))**

Eli: long and arduous process for the realization of an agricultural park. Starting with finding all the users, and starting an initial conversation with them. Solution:

- A key game changer was the call by Flemish government for establishing agricultural parks in 2015 (*Project Call for Productive Landscapes*) appointing two experts to supervise the process; crucial: this in turn required a policy decision and an agreement to do it.
- Long-term thinking is needed from policymakers – after elections (every 6 years) there is a need to 'explain' the park – at the same time, demonstrating positive effects is a useful push factor (asset).
- Benchmarking is important: there is a need for research on similar examples to prove it can be done.
- Also looking at the supra-local: getting other governments on board, building support; there was a need to consult carefully with the services that have to issue permits from the start.

Stefaan: Term 'park' is unclear. Since it indicates public use, the city has held on to it. But intentions unclear - farmers did not understand why the process took so long. Lesson: terminology and clear communications are important..

Bram: negative advice by the agriculture department of Flanders for their food forest planted on raised beds – non-machine farming not considered as efficient farming practice, due to the productive agricultural nature of the park. This is not a binding advice for the city who decides about the permission

### **Barriers and Lock-ins**



**Figure A2.14**

### **Discussion excerpts: (see summary transcript )**

**Paul Lingier:** nature has limited opportunities. There is a lot of potential for meadow birds, but they are not there, because there is too much disturbance; sheep and cows are not affected by this disturbance.

**Jan:** (1) Access: main entrance to the park is not clear - the city has purchased land to make a better main entrance; works are currently underway, (2) parking shortage in the village, even

outside school hours, solution: shared use of the school car park: 90 parking spaces available. 466 steps, walking distance 4 min, 350 m to Stene village.

**Joke/Bram:** (1) lack of toilets and changing rooms for those who work on the field, solution: toilet, shower, kitchen and storage space will be furnished for Buitengoed by the city, short-term collaboration with co-housing; (2) not enough storage for machines, solution: extra tunnel greenhouse and in winter on a city farm near the Polderdijk. (3) polder clay is not ideal for growing vegetables, solution: soil improvement measures and extra tunnels.

**Future:**

**Stefaan** expresses concern: will more visitors and tenants not compromise on the park's peace and tranquility?

**Dirk** suggests revenue models for farmers, (1) asking for access fee – response: open access park is preferred. (2) sale of local products, e.g. milk, organic shop – response: already done with the mutton and vegetables (farm shop run by Buitengoed)

**Expansion of the agricultural park**

**Joke:** Scaling up: capacity problem in terms of land and personnel is not there.

**Hannah:** look for collaborations, e.g. community garden in 0.666, there is cooperation with various parties..

**Dirk:** expansion can indeed only work with alternative and non-competitive opportunities in different locations and different actors; e.g. more large-scale farmers on better soils – different concepts.

**Kathy:** other models are also possible: making land available to independent farmers (cf. system of call in Ghent and Leuven).

## **2.10 FG Meeting: Green Canteen in Krzyżowa: toward plant-based, circular and low emission food system (University of Wroclaw/Krzyżowa)**

### **Background**

The Krzyżowa Foundation for Mutual Understanding operates an education center and International Youth Meeting Centre in Krzyżowa, Lower Silesia (PL), focusing on key issues, such as sustainable development, climate change, and social, political, and ecological challenges, as well as the role of individuals and communities in driving change. Since 2017, the Foundation has been working to integrate the knowledge shared in its educational programs into on-site practices, particularly regarding the food system. As a facility with a canteen and restaurant, they are transitioning towards a low-emission food system that emphasizes plant-based, seasonal, and locally sourced food. Although the process has been challenging and progress is slow, the Foundation team remains committed, currently updating its strategy and analyzing the food system to achieve their goal of a “Green Canteen” that offers a tasty, low-carbon menu.

### **Participants:**

- **Monika Onyszkiewicz** - Fundacja Ekorozwoju, facilitator, development strategy team
- **Agnieszka Duduś** - Education project officer, the development strategy team coordinator
- **Tamara Chorąży** - Education project officer



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

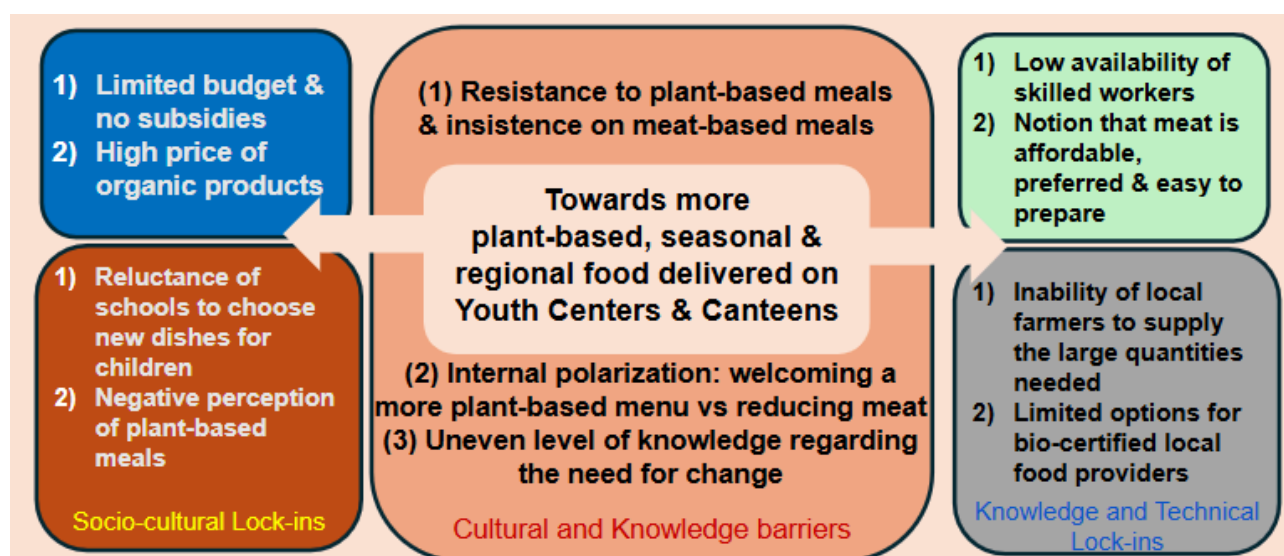
- **Przemysław Nowak** - Administrative officer
- **Monika Zielińska** - Head chef of kitchen team

### The Krzyżowa case:

*Green Canteen in Krzyżowa: toward plant-based, circular and low emission food system*

| Name                                             | Focus                                                                                  | Value Proposition                                                                                                                                                                                                                                     | Target groups                                                    | Progress                                |
|--------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------|
| The Krzyżowa Foundation for Mutual Understanding | <b>Greener meal planning with local, seasonal foods for Youth Centers and Canteens</b> | Walk the talk!<br>Reinforcing the consistency between theoretical and practical aspects of the organization's mission in Krzyżowa<br>In terms of social relations, caring for the environment and being a leader of change. Also the difficult change | Internal management decision makers<br>Internal team<br>Visitors | <b>TRL7 SRL6 IRL 7</b><br><br>Six years |

### Barriers and Lock-ins for greener meals in youth center canteens



### Lesson Learned, and excerpts, in more detail

#### Main takeaway

The discussion highlighted internal challenges, including team polarization and poor communication, as well as external barriers such as budget constraints and local food supply limitations. Opportunities exist in leveraging subsidies, improving communication, and meeting external demands for better vegetarian options. Positive feedback from external events has provided much-needed reinforcement, showing progress and potential for transformation.

#### Weaknesses: Existing Infrastructure and Team Capabilities as a Strong Foundation for Change

Krzyżowa benefits from a solid foundation, including well-developed infrastructure, such as an on-site restaurant, accommodation facilities, and a garden with the potential to grow herbs and support composting initiatives. The kitchen is well-equipped, enabling efficient meal preparation,

and the team brings diverse skills and extensive experience in both culinary work and organizing closed events. These assets position the organization to deliver high-quality services and serve as a strong starting point for implementing meaningful changes in its food system.

### **Internal Challenges: Resistance to Change and Communication Issues**

Despite its strengths, Krzyżowa faces several internal challenges, including an uneven understanding within the team regarding the importance and urgency of transitioning toward a more sustainable food system. There is a general reluctance among some staff to embrace changes, which creates friction. Poor internal communication exacerbates these issues, as negative feedback is often expressed in a non-constructive manner. Additionally, there is insufficient external communication to visitors about the changes being implemented, limiting awareness, support, and buy-in for the ongoing transformation efforts.

### **External Opportunities: Meeting Demand for Sustainable, Plant-Based Options**

Krzyżowa has significant opportunities to align its food system with emerging external trends and demands. Access to subsidies and funding for low-emission initiatives could provide critical support for the transition process. There is also growing external demand for higher-quality, plant-based, and vegetarian menu options, creating an opportunity to enhance Krzyżowa's offering and reputation. Furthermore, Krzyżowa's favorable geographical location and existing resources place it in a unique position to showcase local cuisine as an asset, further attracting interest and support.

### **Challenges: Financial Constraints, Limited Resources, and Resistance to Change**

- **Budget Constraints:** Krzyżowa relies heavily on income from commercial events and project subsidies, limiting financial flexibility for implementing sustainable changes.
- **Affordable Meat Options:** Meat remains the most cost-effective and easiest option to prepare, reinforcing its dominance on the menu.
- **Limited Local Resources:** High-quality, bio-certified local food suppliers are scarce, making it difficult to source sustainable products in large quantities.
- **Internal Resistance:** Vocal opposition from parts of the team to initiatives like "Plant-Based Fridays" has led to setbacks and stalled progress.
- **Team Polarization:** There is a divide between staff advocating for plant-based menus and those resistant to reducing meat consumption.
- **Negative Feedback and Demotivation:** The kitchen team often faces demotivation, as changes toward plant-based meals are met with louder criticism from dissatisfied guests and staff.
- **External Pressures:** School groups, a significant portion of visitors, prefer predictable, meat-based meals, further complicating efforts to transform the menu.

## Annex 3. Summary of collected lock-ins and barriers from CLEVERFOOD FGs

**Cross-comparison Table of Lock-in factors & Barriers between Focus Groups. Lock-ins/barriers are color-coded according to Figure 6**

| FOCUS GROUP            | THEME                  | CASE STUDY                           | Economic factors                             | Socio-cultural perspectives                                                      | Policy & Institutions                                                                                               | Digitalization & Data                                                   | Tacit & Expert Knowledge                                   | Technical & practical processes                                           | BARRIERS                                                                                                                                                                         |
|------------------------|------------------------|--------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FG 1 Marathon (Greece) | Educational innovation | Case 1: Knowledge & Consumer Choice  |                                              | - Lock-in 1: Cultural perception: less perfect food is not pleasing to consumers | - Lock-in 1: Food safety legislation forbidding business models with food waste                                     |                                                                         |                                                            |                                                                           | <p>- Barrier 1: Lack of FabLab Strategy for food waste reduction</p> <p>- Barrier 2: Exclusive focus on tech innovation limiting outreach</p>                                    |
|                        |                        | Case 2: Food Adverts                 |                                              | - Lock-in 1: Social norms of parents on mobile use apps differ across countries  |                                                                                                                     | - Lock-in 1: Mobile operating systems changing regulations for GPS data |                                                            |                                                                           | <p>- Barrier 1: No adequate funding on public health monitoring in canteens &amp; schools</p> <p>- Barrier 2: Schools / parents don't allow mobile phones assessments</p>        |
|                        |                        | Case 3: Agricultural Land use change |                                              |                                                                                  | <p>- Lock-in 1: Curricula not addressing Sust. food</p> <p>- Lock-in 2: City disconnect from agricult. planning</p> |                                                                         | - Lock-in 1: Little knowledge on regional land use & farms | - Lock-in 1: Link between food consumption & land use not well understood | <p>- Barrier 1: Insufficient regional detail for users to explore their city environ.</p> <p>- Barrier 2: No stakeholder awareness on land use alternatives &amp; innovation</p> |
|                        |                        | Case 4: Food Teaching                | - Lock-in 1: Involving external experts cost | - Lock-in 1: General lack of civic participation                                 | - Lock-in 1: Dissimilar educational systems                                                                         |                                                                         |                                                            |                                                                           | - Barrier 1: Structurally very little time to train teachers                                                                                                                     |

|                                                 |                                    |                                                                                                   |                                                                                                                               |                                                                                                                           |                                                                                                                                               |                                                   |  |                                                                                                                        |                                                                                                                                                                                                           |
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|                                                 |                                    |                                                                                                   | money or other rewards                                                                                                        |                                                                                                                           | - Lock-in 2: Curricula lacking framework                                                                                                      |                                                   |  |                                                                                                                        | - Barrier 2: Teachers lack competences to integrate food systems as a topic in curricula                                                                                                                  |
| <b>FG 2<br/>Wageningen UR<br/>(Netherlands)</b> | Data-driven innovation             | Case 1: Eco-labeling                                                                              |                                                                                                                               | - Lock-in 1: Ambivalence of NutriScore and too many labels                                                                | - Lock-in 1: EU paused development of EU food sustainability labeling                                                                         |                                                   |  |                                                                                                                        | - Barrier 1: Fragmented research efforts in research community and in (national) policies<br><br>- Barrier 2: Inherent complexity of environmental systems and indicators                                 |
|                                                 |                                    | Case 2: Performance Assessment Systems                                                            |                                                                                                                               | - Lock-in 1: Dominance of North-America, Australian & UK companies                                                        | - Lock-in 1: Fully retail driven<br><br>- Lock-in 2: No EU-wide harmonized assessment system                                                  | - Lock-in 1: Data access, confidentiality & trust |  |                                                                                                                        | - Barrier 1: No consumer communication (B2B only)<br><br>- Barrier 2: Low sustainability prioritization companies                                                                                         |
| <b>FG 3<br/>IrsiCaixa<br/>(Spain)</b>           | Citizen Participation technologies | Case 1: Web-based platform to promote healthy & sust. food                                        | - Lock-in 1: Socio economic inequalities                                                                                      | Lock-in 1: Disinterest of community to change habits & awareness on healthy eating                                        |                                                                                                                                               | Lock-in 1: Digital saturation                     |  |                                                                                                                        | - Barrier 1: Digital coldness of web platforms<br><br>- Barrier 2: Digital illiteracy (divide) & wWide diversity in community needs                                                                       |
| <b>FG 4<br/>AKI<br/>(Hungary)</b>               | Innovation & biomass               | Case 1: Innovative crop production in marginal areas for biomass production in a circular economy | - Lock-in 1: New biogas plant for only electricity production not profitable, per rules of linear economy<br><br>- Lock-in 2: | - Lock-in 1: Not enough or unreliable exiting labor<br><br>- Lock-in 2: Agriculture (energy crop production) unattractive | - Lock-in 1: Strict EU food safety rules, also for feed.<br><br>- Lock-in 2: Authorisation of experimental feed is expensive & time-consuming |                                                   |  | - Lock-in 1: Climate change: hotter, drier summers, drought, spring frosts<br><br>- Lock-in 2: Geographical location & | - Barrier 1: Lacking experience on growing Sida hermaphrodita in Hungary<br><br>- Barrier 2: Difficulty for farmers to adapt to different agro-technique (e.g. not using pesticides).<br><br>- Barrier 3: |

|                                     |               |                                                |                                                                                                       |                                                                    |                                                                                                                                                                     |  |                                                                    |                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                     |               |                                                | energy crop production takes long to become profitable                                                | profession                                                         | <p>- Lock-in 3: Lacking legislative framework. Hard legislative process in Hungary.</p> <p>- Lock-in 4: Strong political &amp; policy implications &amp; links.</p> |  |                                                                    | topography: sandy soil with low humus content       | <p>Difficulty for growers to try new methods (experiences &amp; costs)</p> <p>- Barrier 4: Lacking value chain for the Virginia mellow</p> <p>- Barrier 5: Biomass molds or rots at storage, agrotechnics not yet solved</p> <p>- Barrier 6: Lacking adequate production of propagating material.</p> <p>- Barrier 7: Limited access to data for multiplicability (e.g. historic LU)</p> <p>- Barrier 8: Farmers interest in only profitable production methods</p> <p>- Barrier 9: Paradigm shift: producers to sell crop on contract, not own market</p> |
| <b>FG 5<br/>SEGES<br/>(Denmark)</b> | Greener meals | Case Study 1: Nuts with Danish Roots           | <p>- Lock-in 1: Disparity local &amp; foreign prices</p> <p>- Lock-in 2: High price of local nuts</p> |                                                                    |                                                                                                                                                                     |  | - Lock-in 1: Farmers lack awareness of nut market (S&D) for profit | - Lock-in 1: Long harvest time for nuts (5-8 years) | <p>- Barrier 1: Difficulty to find labor for nut picking</p> <p>- Barrier 2: Lack of farmers' knowledge on growing &amp; harvesting</p>                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                     |               | Case Study 2: More Danish Legumes on the Plate | <p>- Lock-in 1: High price of legumes in low quantities</p>                                           | <p>- Lock-in 1: Lack of demand for legumes</p> <p>- Lock-in 2:</p> |                                                                                                                                                                     |  |                                                                    |                                                     | <p>- Barrier 1: Unclear on roles to address small quantities</p> <p>- Barrier 2:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                                        |                             |                                                                                 |                                                                                                        |                                                                                                                                                                                      |                                                                                                                                                           |  |                                                      |  |                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------|-----------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                             |                                                                                 | - Lock-in 2:<br>Unattractive prices for farmers                                                        | Coastal & small towns: different culture on being vegetarian, which carries a stigma.                                                                                                |                                                                                                                                                           |  |                                                      |  | <p>Distribution issues for small quantities</p> <p>- Barrier 3:<br/>Danish food culture &amp; consumption habits</p> <p>- Barrier 4:<br/>Lack of skills, knowledge &amp; familiarity with legumes (consumers)</p> <p>- Barrier 5:<br/>Organic goals in kitchens</p> <p>- Barrier 6:<br/>Naming of peas and perception</p> |
| <b>FG 6<br/>Cork<br/>(Ireland)</b>     | Role of LL as change makers | Case Study: Cork City, Finding a Common Language for Healthy & Sustainable Food | - Lock-in 1:<br>Lack of financial resources in local authorities to drive sustainable food initiatives | <p>- Lock-in 1:<br/>Food inequities halting fair access to healthy, regional &amp; sust. food</p> <p>- Lock-in 2:<br/>Consumer preferences on healthy, regional sustainable food</p> | - Lock-in 1:<br>Division between researchers & politicians on food policy impact                                                                          |  |                                                      |  | <p>-Barrier 1:<br/>Limited engagement with food retailers &amp; farmers</p> <p>- Barrier 2:<br/>Unclear roles &amp; poor comm. among government &amp; local entities</p>                                                                                                                                                  |
| <b>FG 7<br/>Brussels<br/>(Belgium)</b> | Role of LL as change makers | Case Study: Brussels City, Towards healthier and more sustainable food services |                                                                                                        |                                                                                                                                                                                      | <p>- Lock-in 1:<br/>Lack of public health officer in local gov.</p> <p>Lock-in 2:<br/>Lack of policies due to EU rules (at the cost of local farmers)</p> |  | - Lock-in 1:<br>Lack of health competences in cities |  | <p>- Barrier 1:<br/>Focus on sustainability is larger than on health</p> <p>- Barrier 2:<br/>Lack of prioritization of local producers in markets</p>                                                                                                                                                                     |

|                              |                                 |                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                     |                                                                                                            |                                                                                                                                               |                                                                                                                                                      |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                              |
|------------------------------|---------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                                 |                                                                                |                                                                                                                                                                                                                                                       |                                                                                                                                                     | Lock-in 3:<br>Weak health policies in food promotion                                                       |                                                                                                                                               |                                                                                                                                                      |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                              |
| <b>FG 8 ÖMKI (Hungary)</b>   | Digital monitoring              | Digital technology innovation in grazed beef cattle farming                    | <ul style="list-style-type: none"> <li>- Lock-in 1: No competition in distributors at national level</li> <li>- Lock-in 2: EU market too small for free range tools</li> <li>- Lock-in 3: 80% export of high-quality meat vs cheap imports</li> </ul> | <ul style="list-style-type: none"> <li>- Lock-in 1: Aging farmers/ no generation shift</li> <li>- Lock-in 2: Resistance to digital tools</li> </ul> | <ul style="list-style-type: none"> <li>- Lock-in 1: Bureaucracy is obstacle for tool investment</li> </ul> | <ul style="list-style-type: none"> <li>Lock-in 1: ALLFLEX software inflexible</li> <li>- Lock-in 2: No national data harmonization</li> </ul> |                                                                                                                                                      |                                                                                                                                                             | <ul style="list-style-type: none"> <li>- Barrier 1: Language barriers using tools</li> <li>- Barrier 2: Price sensitive customers</li> <li>- Barrier 3: Investment in digital tools of low priority with farmers</li> <li>- Barrier 4: Certain digital functions are missing (alarm) or imperfect</li> </ul> |
| <b>FG 9 Ostend (Belgium)</b> | Agro-park lock-ins              | Case 1: Agri-park lock-ins                                                     | <ul style="list-style-type: none"> <li>- Lock-in 1: Expansion: availability and prices of land</li> <li>- Lock-in 2: Product pricing / viable business plans</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>- Lock-in 1: Consumer preferences on healthy, regional &amp; vegetarian food</li> </ul>                      | <ul style="list-style-type: none"> <li>- Lock-in 1: No further national policy calls</li> </ul>            |                                                                                                                                               |                                                                                                                                                      | <ul style="list-style-type: none"> <li>- Lock-in 1: Stakeholders mainly from social, less agricultural sector</li> </ul>                                    | <ul style="list-style-type: none"> <li>- Barrier 1: Trust towards city plans</li> <li>- Barrier 2: Competing functions</li> <li>- Barrier 3: Spatial &amp; infractural access</li> </ul>                                                                                                                     |
| <b>FG Krzyżowa (Poland)</b>  | Greener meals in youth canteens | Case 1: Green Canteen in Krzyżowa: toward plant-based, circular & low emission | <ul style="list-style-type: none"> <li>- Lock-in 1: Limited budget &amp; no gov. subsidies operation relies on commercial/ private events &amp; subsidies from</li> </ul>                                                                             | <ul style="list-style-type: none"> <li>- Lock-in 1: Reluctance of/risk factors for schools to choose dishes children may not eat.</li> </ul>        |                                                                                                            |                                                                                                                                               | <ul style="list-style-type: none"> <li>- Lock-in 1: Low availability of skilled kitchen workers</li> <li>- Lock-in 2: Notion that meat is</li> </ul> | <ul style="list-style-type: none"> <li>- Lock-in 1: Local farmers cannot supply the larger quantities of organic produce needed to feed citizens</li> </ul> | <ul style="list-style-type: none"> <li>- Barrier 1: Differences in opinion on menu: resistance to plant-based Fridays &amp; insistence on a meat-based meal.</li> <li>- Barrier 2: Polarization in catering team:</li> </ul>                                                                                 |

|  |  |             |                                                                                                                                 |                                                                                                              |  |  |                                           |                                                                               |                                                                                                                                                                                 |
|--|--|-------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--|--|-------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | food system | ongoing projects<br><br>- Lock-in 2:<br>Organic products are more expensive than conventional products, resulting in resistance | - Lock-in 2:<br>Perception that more plant-based meals is a problem and vegetarian meals are less attractive |  |  | affordable, preferred and easy to prepare | - Lock-in 2:<br>Limited options for good local food providers (bio-certified) | those welcoming a more plant-based menu vs those against reducing meat<br><br>- Barrier 3:<br>Uneven level of knowledge of workers and the public regarding the need for change |
|--|--|-------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--|--|-------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## Annex 4. TRL - SRL - IRL

### Defining Innovation Readiness Levels for use in already-completed project FoodSHIFT 2030

|   | <b>TRL (Horizon 2020[1])</b>                              | <b>SRL (Innovation Fund Denmark[2])</b>                                                                                                            | <b>IRL (The Entrepreneurs Advisor [3])</b> | <b>IRL (Interreg France-Wallonie-Vlaanderen GoToS3 [4])</b>                                   |
|---|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1 | Basic principles observed                                 | Identifying problem and identifying societal readiness                                                                                             | You have an idea                           | Basic principles are observed and described                                                   |
| 2 | Technology concept formulated                             | Formulation of problem, proposed solution(s) and potential impact, expected societal readiness; identifying relevant stakeholders for the project. | Business concept                           | Concept of the solution / application formulated                                              |
| 3 | Experimental proof of concept                             | Initial testing of proposed solution(s) together with relevant stakeholders                                                                        | You have thought through your idea         | Proof of concept for the solution/application and feasibility study                           |
| 4 | Technology validated in lab                               | Problem validated through pilot testing in relevant environment to substantiate proposed impact and societal readiness                             | Created an actionable plan                 | Prototype incorporating the solution approved in the laboratory                               |
| 5 | Technology validated in relevant environment              | Proposed solution(s) validated, now by relevant stakeholders in the area                                                                           | Scaled testing of prototype / model        | Prototype approved for all of its critical functions in a meaningful environment              |
| 6 | Technology demonstrated in relevant environment           | Solution(s) demonstrated in relevant environment and in co-operation with relevant stakeholders to gain initial feedback on potential impact       | Designed and tested support systems        | Product demo approved in a meaningful environment performing in a similar way to expectations |
| 7 | System prototype demonstration in operational environment | Refinement of project and/or solution and, if needed, retesting in relevant environment with relevant stakeholders                                 | Full testing of systems and products       | Product demo approved in an operational environment                                           |
| 8 | System complete and qualified                             | Proposed solution(s) as well as a plan for societal adaptation complete and qualified                                                              | Make systems/product adjustments           | Complete, clearly qualified commercial product is available                                   |
| 9 | Actual system proven in operational environment           | Actual project solution(s) proven in relevant environment                                                                                          | Ready for full scale operations            | Product suitable for different applications and subject to competitive production.            |

[1] <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/faq/2890>

[2] [https://innovationsfonden.dk/sites/default/files/2018-08/societal\\_readiness\\_levels\\_-\\_srl.pdf](https://innovationsfonden.dk/sites/default/files/2018-08/societal_readiness_levels_-_srl.pdf)

[3] <https://blog.theentrepreneursadvisor.com/2017/10/innovation-readiness-level/>

[4] [http://avnir.org/documentation/congres\\_avnir/2017/PPT/TRL\\_AEI\\_Congres\\_avniR\\_2017\\_.pdf](http://avnir.org/documentation/congres_avnir/2017/PPT/TRL_AEI_Congres_avniR_2017_.pdf)



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## Annex 5. Food eco-labelling: Further background information

Following Deconinck et al., (2023), the rise of environmental impact reporting is fast (with many initiatives already underway) and dynamic (with a sometimes confusing landscape of organisations, approaches, proposals and methodologies competing for attention). One of the important drivers of this trend is with the approval of life-cycle assessment (LCA) methodology as being the key in environmental sustainability metrics. The EU recommends using PEF methods to calculate the environmental performance as the most reliable, comparable and verifiable way to know the real environmental footprint of a product or organisation to date (EC, 2021b).

### **Need for greater cooperation within the Departments of the European Commission**

Four policy initiatives are of key importance in the context of future harmonised sustainability measurement system, all dealing with food labelling - with the sustainability labelling framework (SLF) being of an overarching nature and other initiatives like Green Claims Initiative (GCI), Proposal for front-of-pack nutrition labelling (FOPNL) and Proposal for animal welfare labelling (AWL) contributing to it.

The European Commission's ambition was to "Set the foundations for the systemic changes that are needed by all actors of the food system, including policy makers, business operators and consumers in order to accelerate the transition to a sustainable EU food system". This included a communication on a New framework legislation on a Union sustainable food system by EG GFL SFS and AGSFS in 2022 (EC, 2022). However, the Commission has paused the work that resulted in criticism and multiple open letters urging to resume the work. Endorsed by 25 participating organisations under the Food Policy Coalition, a Joint call for food system transformation and a legislative framework for sustainable food systems in the next mandate has been presented to the president of the EC von der Leyen in May 2024.

### **Obligation for sustainable reporting**

Reporting on the sustainability of companies helps investors, civil society organisations, consumers and other stakeholders to evaluate the sustainability performance of companies, as part of the European green deal. The first companies will have to apply the new rules for the first time in the 2024 financial year, for reports published in 2025.

### **Need for more digitalisation**

Working towards one EU framework of food sustainability labelling can be led forward through digitalisation. Digitalisation is a uniform language that is needed for co-creation among many stakeholders of our food system: policy-makers, researchers, educators, NGOs, innovators, accelerators, investors, and also distracted consumers and informed citizens, social media specialists and hobbyists, hospitality industry professionals and home cooks, food industry players, of which also farmers. A call for dedicated efforts in



developing an interactive open-space communication, supported by ontologies in decoding complex connectivities within a sustainability food labelling.

**Need for harmonisation of eco-labelling as the key building block to food sustainability labelling**

In Europe, governments are stimulating the demand for product-level environmental information in the agri-food sector. Food eco-labelling is also called rated labelling and is based on a life-cycle assessment (LCA) approach. In more and more cases, the LCA remains the underlying methodology, while the reference is made to so-called Environmental Footprint (EF) methods. Use of LCA and EF-methods is increasingly important in EU policies.

Table 5. Selected LCA-based ecolabelling initiatives communicating environmental impact of products

| Eco-Score                                                                          | Planet-Score                                                                       | Envirocore                                                                         | Eco Impact                                                                         | Coop Sweden Sustainability Declaration                                             | Made Green in Italy                                                                  | French initiative                                                                    |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |

Source: Boone et al., 2023

There are still challenges to address around harmonisation of various ecolabelling schemes that have rapidly emerged in the past three years. The Eco Food Choice project brings forward a study that analyses 16 LCA-based ecolabels from public and private sectors against 40 criteria to assess their credibility, consistency, and transparency (Cicek et al, 2024).

Following (Boone et al., 2023), the introduction of LCA-based ecolabelling initiatives for all food could be a game changer for making food more sustainable. The introduction is supported both by governments and large retailers all over Europe. There are still several issues that need to be solved but this support will create many resources to help solve these problems. The report by Cicek et al (2024) presents these issues and critical success factors for a harmonised European ecolabelling system to enhance trust and support the sustainable food transition. Each individual ecolabelling initiative is learning and adjusting while operationalising at the same time. This comes at a cost, as the individual developments lack alignment.

The report by Cicek et al (2024) concludes with a vision for the future of ecolabelling in the EU: harmonised approach with the right governance in place to secure trustworthiness, transparency, consistency and future developments and updates. In this vision multiple stakeholders take each their own specific roles, such as:

- Ecolabelling schemes work with clients to operationalise ecolabelling, using their own tooling to achieve this.
- Retailers provide information to the platform on data availability and learnings from consumer behaviour
- Data providers provide data either to further develop the background database or to meet the primary data requirements.
- Secondary database owners support the development of the secondary database.
- Verifiers assess whether ecolabelling schemes comply with the LCA method, ecolabelling method and data requirements.
- NGOs provide their critical view, raise awareness, and act as advocates for social change.