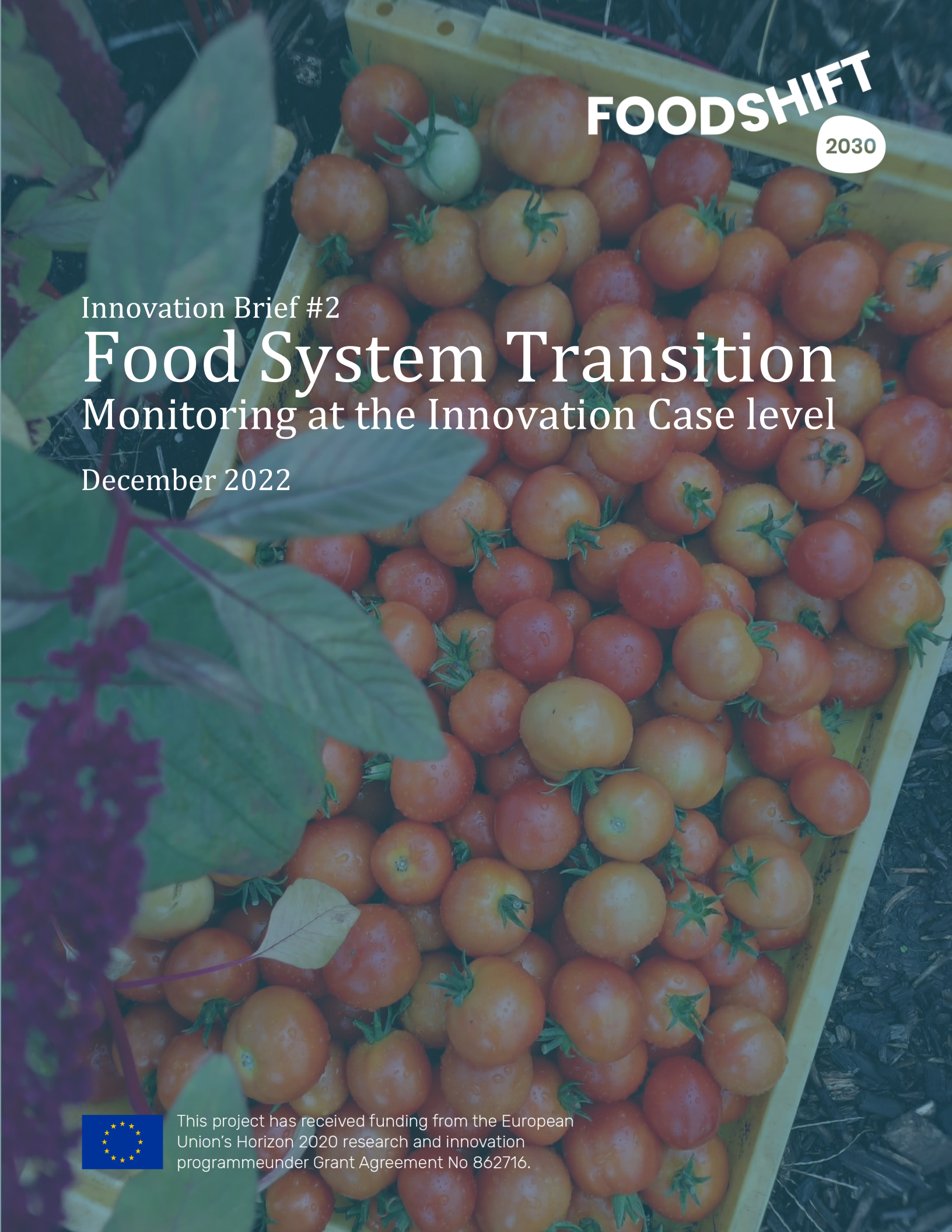

FOODSHIFT 2030

Innovation Brief #2

Food System Transition

Monitoring at the Innovation Case level

December 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programmeunder Grant Agreement No 862716.

Project Title	FoodSHIFT2030 - Food System Hubs Innovating towards Fast Transition by 2030
Contract Number	862716
Work Package	WP2 Accelerating the Solutions
Deliverable	D2.6 Briefs on Innovation Potentials of Food Systems (2)
Task(s)	Task 2.2 Mature existing food system innovations towards higher TRLs and SRLs Task 2.3 Combine existing food system innovations across the food value chain Task 2.4 Devise plan for scaling up food system innovations towards wider application in the city-region
Document Name	Innovation Brief #2 Food System Transition Monitoring at Innovation Case Level
Due Date	M36: 31 December 2022
Submission Date	M36: 31 December 2022
Dissemination Level	[X] P - Public [ ] CO – Confidential
Deliverable Lead	SusMetro EU BV Tilburg, the Netherlands
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Reviewers	Anita Beblek (Agrathaer) – Technical Reviewer Luke John Schafer (UCPH) – Open Review
Keywords	Acceleration, Innovation, Monitoring
Statement of originality	This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Abstract (for public dissemination only)	The following document contains General guidelines and templates for the production/collection of fair data and storage in the foodshift2030 data warehouse

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FoodSHIFT2030 innovation Brief #2

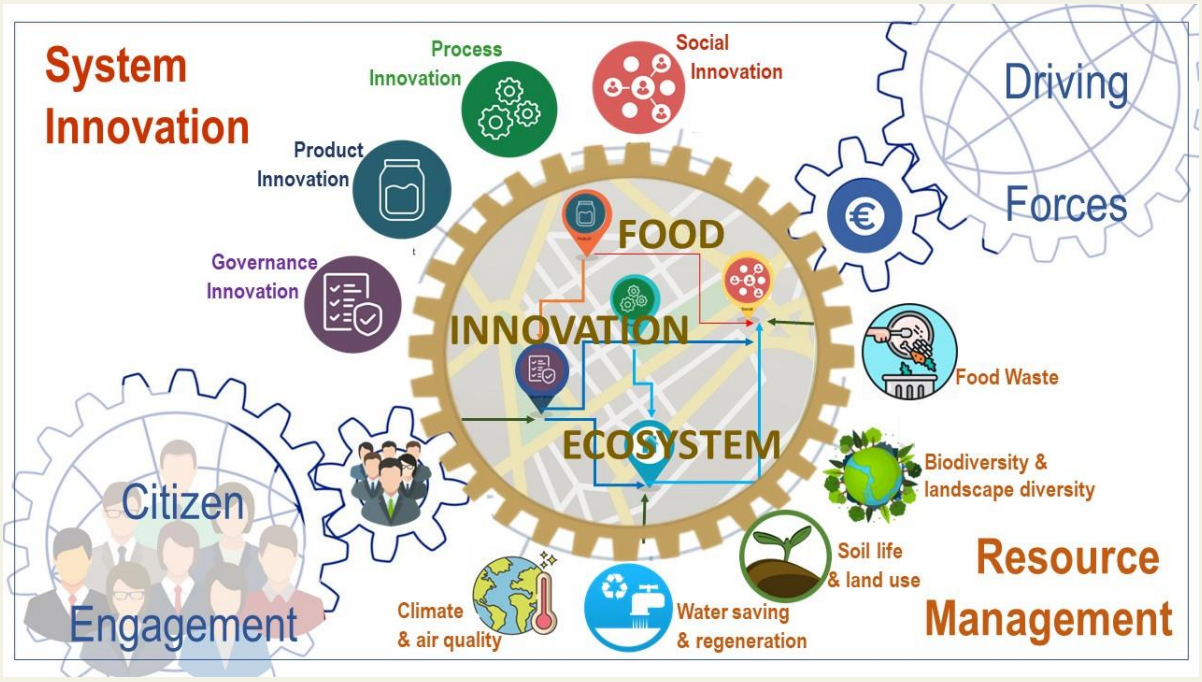
Food System Transformation – Monitoring at the Innovation Case Level

Dirk Wascher, Poppy Eyre, Gustavo Arciniegas

1. Introduction & Context

Change vs Transformation

According to the Cambridge Dictionary, transformation can be defined as "a complete change in the appearance or character of a something or someone, especially so that that thing or person is improved". However, change is not the same as transformation. According to various sources[i], change is mainly concerned with making the past better – in the case of the food system, this would mean to achieve less obesity, less food miles, less CO2 emissions and less usage of synthetic agricultural inputs, more plant-based food consumption and more people making a living from regional food. According to the same sources, 'transformation' is less based on the past, but is about creating a vision of the future that is entirely different. The fitting metaphor derives from biological transformations: the future food system is not a better caterpillar, but a butterfly – hence something entirely different.[1] While improving the current food system is mainly done by managers, a transformation requires vision, cross-sectoral collaboration and eventually the role of leaders. Fortunately, the European Commission has stepped forward by drafting the 'Farm to Fork Strategy' as part of the Green Deal – policy documents that can be considered as being visionary.



[1] Joanne Pagett (Change vs Transformation by Joanne Pagett | Business Transformation Network (thebtn.tv); Shine on Society (Change versus Transformation - Bing video)

Figure 1: The four cornerstones of a Food Innovation Ecosystem: System Innovation, Resource Management, Citizen Engagement and Driving Forces (Wascher 2022)

This strategy hinges largely upon transformative goals as it suggests to:

- Ensure food production, transport, distribution, marketing, and consumption have a neutral or positive environmental impact;
- Preserve and restore the land and sea-based resources;
- Mitigate climate change;
- Reverse the loss of biodiversity;
- Ensure food security, nutrition, and public health.

While there is reference to the Circular Economy Action Plan (CEAP) demanding a regulatory framework for certified carbon removals, the topic of 'circular economy' has not yet been taken up in the above coreset of objectives. However, circular economy should be considered as inherent for a sustainable food strategy. Typical issues to be included when monitoring circular economy in food systems are rest-streams and cascade utilization from agriculture and food processing, re-use of food, utilization of by-products and food waste, nutrient recycling, and changes in diet toward more diverse and more efficient food patterns.

In this Innovation Brief, we describe Innovation Ecosystem mainly as networking efforts in the line of 'maturing and combining' different innovators with new stakeholders in the food system. In the following Innovation Brief #3, we will demonstrate how wider, geo-based city region assessments addressing the Innovation Ecosystem including the wider production landscapes around city centers can complement innovation-case-based monitoring, related to the four dimensions of system innovation as depicted in Figure 1.

2. Monitoring Food System Innovation

Why is monitoring important for Food System Innovation?
Monitoring is a management tool needed to understand the actions and changes going on in the food ecosystem that allows one to:

- Measure progress
- Obtain indications of how to improve strategies
- Increase accountability
- Provide policy makers and funding organisations on the relevancy, effectiveness and efficiency of the project or intervention
- Create feedback loops and distribute information effectively

As important, however, is its role in stimulating the participatory and learning process, and enhancing capacity of the key stakeholders (RUAF 2015).

Monitoring aspects of food system transformation at the level of local businesses, projects and initiatives, known as *innovation cases*, or at the scale of city neighborhoods or districts, escapes in most cases the rigors of statistical analysis based on clear quantitative data. Instead assessments rely on system-specific indicators, narratives and observations. For example, demographic studies in South-Rotterdam show that from the 12.000 inhabitants with obesity, 4000 are below 25 years of age. Analyzing the food environment of these inhabitants one encounters a dominance of fast-food restaurants in many of the neighborhoods where these young people live and go to school[2] Though there is no hard evidence – a statistically robust correlation between the concrete number of fast food restaurant and the number of obesity cases in the neighborhood cannot be established at this level – the existence of a causal links between food environment, food habits and health remains plausible as large-scale studies have proven (e.g. Han et al. 2020). It is along these lines that food system monitoring at the level of case studies – here thus the living labs FALs – must operate in the absence of hard scientific data.

In the light of these mentioned limitations, we consider the EU's Innovation Radar Methodology for evaluating H2020 projects (European Union, 2018) as a useful reference. The methodology differentiates three methodological elements, namely (1) Innovation Potential Indicator, (2) Innovation Capacity Indicator and (3) Innovation maturity.

Since the above EU Innovation Radar is largely based on economic innovation cases focussing on market readiness, we selected and amended this framework to better meet the characteristics of the FoodSHIFT2030 project (see Table 1).

The FoodSHIFT2030 Approach to innovation monitoring

Next to inviting all stakeholders and citizens to engage in the debate on the future sustainable food system, the European Commission points especially at *innovation* as one of the agents for transformation. Drawing upon some of the key assets of the EU Innovation Radar Methodology, the FoodSHIFT 2030 project has put bottom-up-processes, citizen involvement and *synergetic effects* at the very centre of its activities:

- **Bottom-up processes**: nine so-called FoodSHIFT Acceleration Labs (FALs) work in close cooperation with municipalities and local stakeholders at a process of maturing, combining and upscaling innovation[3];
- **Citizen involvement**: as part of four main Impact Pathways, the project has launched a citizen empowerment scheme hinged upon the use of the CitizenLab platforms to generate citizen-based activities and involve citizens in decision making processes in the food system.
- **Synergetic effects:** the FoodSHIFT2030 approach relies on the synergetic effects between diverse aspects of innovation exemplified by the FoodSHIFT 2030

[2] CEPHIR 2019: Is Rotterdam een fastfoodparadijs? De voedselomgeving van 2004-2018. Erasmus MC/GGD, 17pp
[3] For more information on Maturing, Combining & Upscaling innovation, see the FoodSHIFT Acceleration Factsheets.

Innovation Portraits for driving food system transformation. It becomes clear when looking at these examples that systemic change requires that innovation occurs on multiple fronts.

While technological and process innovation must still be considered as important drivers of many transitions towards sustainability, the nine FoodSHIFT230 Acceleration Labs (FALs) have demonstrated that social and governance innovation are providing the kind of societal safety nets that creates trust, awareness, understanding and confidence in the process of transition. Measuring progress in the cybernetic space of system innovation requires hence to understand new mechanisms of system resilience through cooperation, citizen participation and synergy effects involving a variety of stakeholders.

3. Monitoring Mechanisms for Food System Innovation

Table 1 highlights the central monitoring activities of the FoodSHIFT2030 innovation acceleration programme targeted at 90 innovation cases in nine city regions. The monitoring mechanisms used are dependent on 2 factors:

- Timing of the monitoring: Baseline (start of the intervention/project) or Ongoing (during the intervention/project)
- Assessment Scale: Innovation Case Level (individual) or Innovation Ecosystem Level (systemic)

Table 1: FoodSHIFT2030 Innovation Monitoring levels and key assessments

Assessment Scale	Baseline Monitoring (2020-2021	Acceleration Monitoring (2022-2023)
Innovation Case Level	Innovation Readiness Levels (IRL) MICRA Interviews Innovation Dimensions	Checkpoints Helicopter View & Deep Dive
Innovation Ecosystem Level	FAL Tailor-Made Trajectories (TMT) MFP Assessment	Network Mapping & Scenarios CitizenLab Campaigning

Innovation Acceleration: Maturing, Combining, Scaling

This innovation brief will focus on monitoring at Innovation Case Level, rather than at Ecosystem Level. However, it is important to keep in mind that innovation cases are undeniably influenced by the surrounding innovation ecosystem, and vice versa.

Box 1 details the building blocks of innovation monitoring, focusing on baseline measurements at innovation case level. These concepts lay the foundation for the monitoring methodologies that are described later in this brief.

It should be noted that the monitoring concepts & mechanisms listed are the result of an ongoing process during the FoodSHIFT 2030 project to adjust and, in some cases, entirely re-design the mechanisms based on feedback from Accelerator Labs. This process highlighted that monitoring mechanisms should be as lean as possible, minimising the time required for the transfer of data from the implementing partner to the researching / monitoring partner.

Box 1: Building Blocks of Innovation Monitoring

To understand and monitor acceleration, we can use a selection of building block concepts that allow us to build an initial picture of the innovations that will be monitored. The 3 building block concepts that can be used to establish a baseline for innovation cases are: Innovation Readiness Levels (IRL), MICRA Interview & Innovation Dimensions. Each of these building blocks are described below:

Innovation Readiness Levels (IRL)

Adapted from TRL & SRL, the Innovation Readiness Levels adopted in FoodSHIFT2030 have been used to assess the maturity of food system innovations at the start of the project activities. The IRLs consist of 9 levels, with level 1 being the earliest stage of an innovation, to level 9 being a fully-fledged innovation that has been successfully implemented. These 9 levels can be simplified into 4 main phases as shown in the figure below. The baseline IRL value has been used as a quantitative reference point for progress in the maturity of the innovations. It is important to note that although increases in IRL are desirable, decreasing IRL is also an important indicator of barriers for food system innovation. This has in fact been frequently the case due to the driving force C19 pandemic (2019-2021) and the financial/energy crisis resulting from the Russian-Ukraine war (2022 – ongoing).

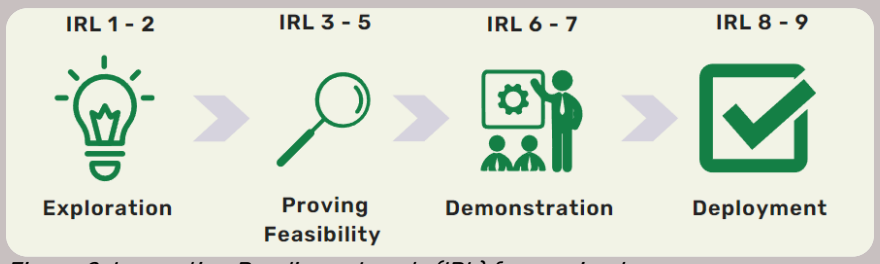


Figure 2: Innovation Readiness Levels (IRL) four main phases.

A note on IRLs

To assess the IRL, the FoodSHIFT Accelerator Labs completed a quantitative survey that assessed their local innovators, including readiness levels. At the time, the IRL concept was not yet developed, meaning that TRL and SRL assessments were used. The need for a more flexible, broad readiness level assessment for food system innovations became clear in this survey process: Many of the innovations did not fit the conventional notion of innovation in terms of product development for the commercial market (TRL), and readiness of the market to accept the innovation (SRL), but instead focused on innovation for communities, co-creation processes, education and governance. Therefore a broader set of Innovation Readiness Levels were developed and implemented to reflect the diversity and multi-faceted nature of food system innovations. The TRL & SRL data collected by the survey were therefore translated to an updated IRL value at a later date.

MICRA Interviews

To understand the innovations identified in the FoodSHIFT city regions, MICRA interviews were conducted with each innovator. MICRA stands for:

Motivation **I**mplementation **C**ooperation **R**estrictions **A**mbitions

According to these 5 topics, semi-structured interviews were conducted. The interview results were analysed to identify recurring or notable needs among the innovators. The needs identified provided a clear starting point from which to begin developing acceleration activities to support the innovators.

Figure 3: Role of MICRA interviews in innovation acceleration

Innovation Dimensions

To be able to group the food system innovations into different types, often requiring different acceleration approaches, the four Innovation Dimensions were used:

- **Product** - Innovations in this category address new or updated
- products, including quality, safety and market impact.
- **Process** - These innovations are relevant to new technologies for
- processing, logistical improvements, infrastructure and
- new/improved services.
- **Social** - Innovations in this category are relevant to changes in
- behaviour (e.g. consumers/citizens), development of new
- relationships and inclusiveness.
- **Governance** - The innovations address policy developments,
- including food planning, subsidies, taxing, certificates & labelling.

Based on the results of the MICRA which offer insights into the function and objectives of the innovations, innovation dimensions were assigned to each innovation case and verified by the local FoodSHIFT Accelerator Lab. The assignment of innovation dimensions also helped to capture which dimensions were most commonly addressed in in city regions, and the dimensions where less innovation was seen.

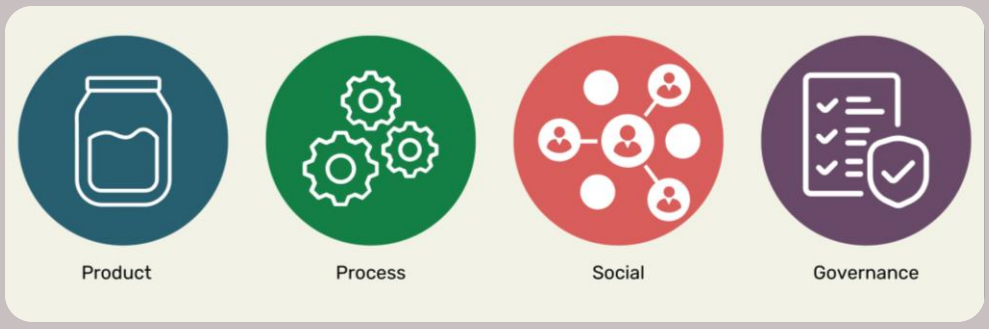


Figure 4: The Four Innovation Dimensions

In order to understand the dynamics of food system transition at the level of city regions, monitoring should occur at regular intervals to understand the process, lessons learned and influencing factors in the food system. The monitoring mechanisms at these intervals should be as lean and flexible as possible so they can accommodate dynamic feedback and minimize the required time investment. In FoodSHIFT 2030, a *Checkpoint* system has been used to collect information verbally from partners, with accompanying documentation in the form of the *Helicopter View & Deep Dive* templates. These two mechanisms are described in more detail below.

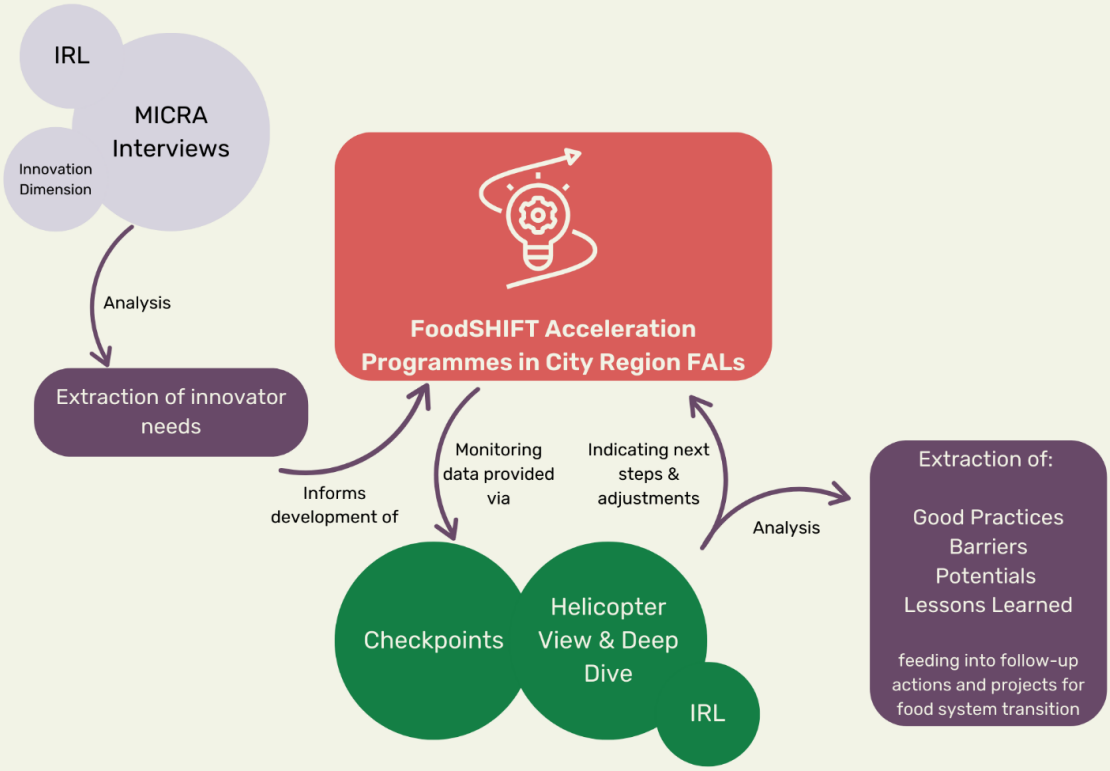


Figure 5: Monitoring structure at Innovation Case Level in FoodSHIFT 2030

Figure 5 demonstrates how the building blocks of innovation monitoring not only provide a reference measurement for comparison with ongoing monitoring (in this case IRL), but actively informs the development of the project activities (in this case the acceleration programmes). This strategic use of data from the baseline monitoring can open the door to transformation through understanding of the status quo and the needs or 'gaps' that must be addressed to allow systemic transformation to take place. Actions to address these needs can subsequently be integrated into the acceleration programme, which is subject to ongoing monitoring. This ongoing monitoring provides data not only for the purposes of analysis and take-away messages for future interventions, but also facilitates reflection on existing activities and the opportunity to adjust or modify activities based on monitoring results.

Checkpoints

City region food systems are dynamic environments, where opportunities and challenges are constantly changing. To capture progress in this dynamic environment, a Checkpoint system can be implemented, as was done so in FoodSHIFT 2030.

These Checkpoints take the form of a 30-minute meeting between the Accelerator Lab (or implementing party) and the researcher/monitoring party, scheduled every 6 weeks. During these checkpoint meetings, a simple, standard agenda is used to collect key insights from the local partners:

- Updates & Progress
- Key outcomes & results
- Challenges
- Next steps

Inputs during this meeting are noted and used as a growing qualitative reference that is later analyzed. This analysis can be tailored to the monitoring goals, though in the case of FoodSHIFT, key aspects extracted for analysis were:

- (Good) Acceleration Practices
- Barriers to acceleration & food system transition
- Potential for acceleration & food system transition
- Lessons Learned

Helicopter View & Deep Dive

Accompanying the checkpoints, 2 templates are used to capture structured written insights:

1. The Helicopter View – used to capture overall acceleration activities, as well as systemic updates.
2. The Deep Dive – capturing best examples of acceleration on innovator level (detailed case-studies).
3. shows an extract of the Helicopter View template used to gather insights on innovation acceleration in the FoodSHIFT city regions towards an innovation ecosystem[4].

Together, the inputs from the Helicopter View & Deep Dive and Checkpoints create a more comprehensive picture of developments in the city region food systems, mainly based on actions surrounding innovation cases, but also contributing substantially to the Innovation

[4] The Innovation Ecosystem monitoring approach will be addressed in Innovation Brief #3.

Ecosystem. With these monitoring mechanisms in mind, we can visualise the structure of the monitoring process and flow of data and feedback, as shown in Figure 5.

4. Examples for Innovation Case Monitoring

To bring this monitoring process to life, examples from the FoodSHIFT 2030 project are highlighted below. These case studies have been selected from the (currently ongoing) monitoring procedures with FoodSHIFT Accelerator Lab city regions, which have so far participated in 3 checkpoints. The case studies demonstrate that the Helicopter View & Checkpoint monitoring mechanisms can be implemented on both an innovation-case specific level (example Berlin) and on a broader ecosystem/thematic level (example Avignon). This flexibility allows us to 'zoom in' to innovator level and 'zoom out' to ecosystem level using data collected from the same monitoring mechanisms.

Case Study 1: Berlin Food Hubs (LebensMittelPunkte)

The Berlin Food Hubs (LMPs) are citizen-driven initiatives that facilitate community building and empowerment using food as an instrument for change. The Food Hubs offer local spaces for trading, sharing, preparing and consuming food, functioning as part of the alternative food network (AFNs). The Food Hubs also offer the opportunity to share knowledge, skills and resources within the local community. The Food Hubs have a strong emphasis on inclusivity and diversity, with the goal of developing a city-wide network of hubs in each city district.

Photo 1: Food preparations at a Food Hub (Source: LMP Baumhaus Berlin)

Taking the Berlin Food Hub innovation case as an example (Fig 6), it is possible to see the level of detail that can be extracted from the Checkpoints & Helicopter View when these mechanisms on a single innovation case level. The three trajectories shown (concept, network & needs) reveal themselves as prominent aspects of the innovation acceleration, which have been captured by the Helicopter View & Checkpoints. Within these trajectories, we can also follow the incremental acceleration of the innovation case and identify which kind of acceleration is taking place. For example, the first trajectory focusing on the innovation concept uses the 'maturing' mode of acceleration, whilst the network trajectory shows characteristics of combining and scaling.

The progress in these acceleration trajectories have also been captured using Innovation Readiness Levels (IRL). As shown in Figure 7, we can see the gradual increase in IRL of two of the 17 Food Hubs that are supported by the FoodSHIFT Accelerator Lab in Berlin. We can

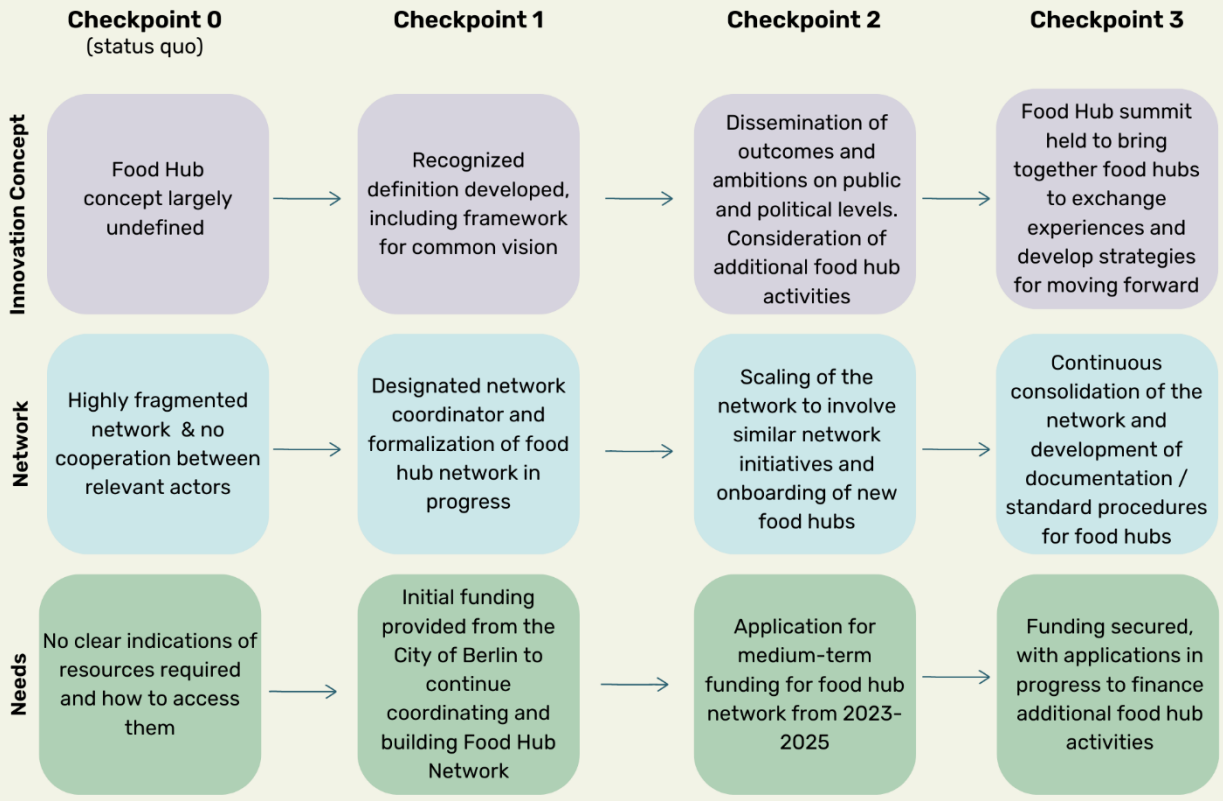


Figure 6: Extract from Berlin FAL monitoring process based on the Food Hub innovation case (extracted from Helicopter View & Checkpoint)

see the steep increase in IRL from the project start until Checkpoint 1, demonstrating how early-stage innovations can especially benefit from acceleration support. For early stage innovations, these developments can include activities such as mission & vision development, creating an organisational structure and formalising the organisation through legal/commercial registration, business planning and identifying the core activities.

Between checkpoints 1 to 3 we begin to see a slowing down in the rate of acceleration. This plateau is quite common among innovators and is often due to the fact that challenges facing innovators at these higher IRLs are often more complex and unexpected barriers must be confronted. These more complex challenges often also require collaboration with other stakeholders, meaning that acceleration processes may be slowed due to the need for relationship building and development of common agreements and partnerships. This can include aspects such as financing, risk management, sourcing / suppliers, scaling & promotion.

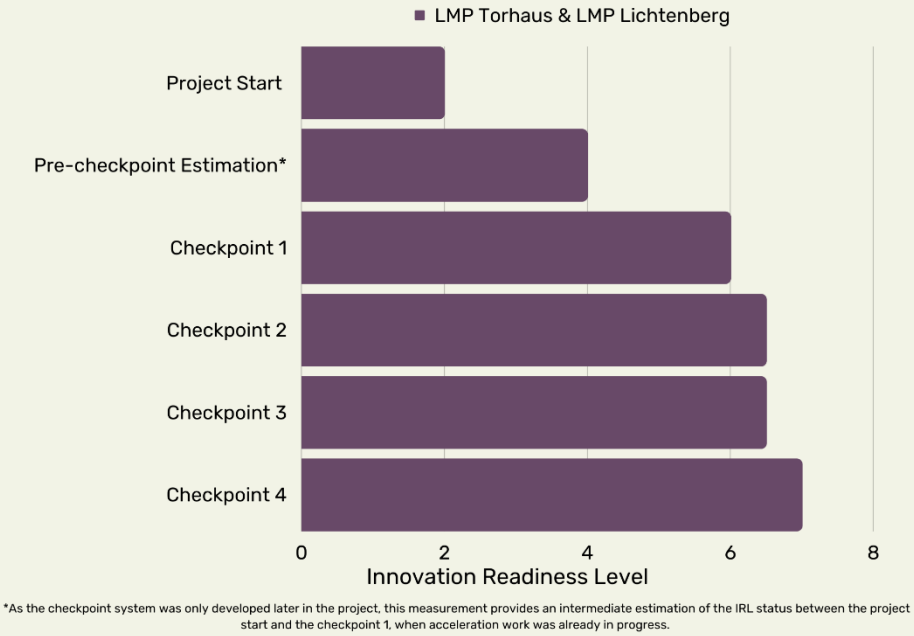


Figure 7 Overview of IRL progress of Food Hubs LMP Torhaus and LMP Lichtenberg in Berlin.

Case Study 2: Sustainable Public Kitchens in Avignon

In Avignon, the Accelerator Lab focus is on the improvement of sustainability among public kitchens. This encompasses diverse aspects such as engagement of local producers as suppliers, waste reduction, and promotion of healthier, more sustainable options in canteens. Multiple innovators are required to address these diverse aspects, as show in Figure 8.

One of their biggest challenge is the *ban of all plastic containers* from food catering system and the development of a local network to implement a new and efficient non-plastic path from cooking to collecting and washing, once used, the new stainless steel containers.

This ambition required the City of Avignon build a new partnership with a stakeholder committed to sustainable activities who just has been established in Avignon: an industrial washer who has fully subscribed to supporting a transition towards sustainable containers. This industrial washer became a key stakeholder to structure the local food system by reusing cooking containers and avoiding plastic containers, combining its activities with other local needs (restaurants, caterers, distribution, food-processing industry…).

There is actually a big demand from other French municipalities to transfer good practices and experiences on that issue; so, Avignon is currently disseminating its processes about ban of plastic to other interested parties.

As for the topic of Food Waste, innovator L'EntrePôt is active in developing a bio-waste solution that can turn residues such as food waste into a useful end product: compost.

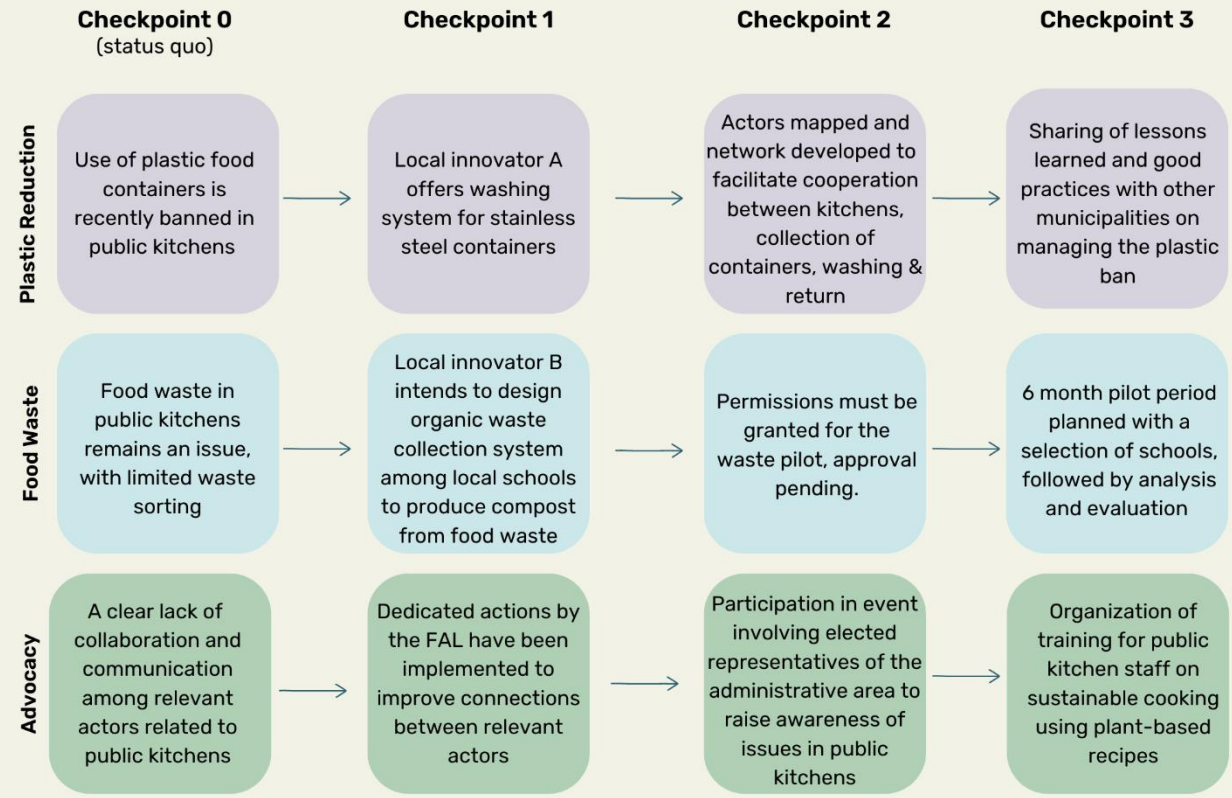


Figure 8: Extract from Avignon FAL monitoring process (extracted from Helicopter View & Checkpoint)

This activity is aiming to collect biowaste within the schools of the city and to product compost in an agricultural land, surrounding the city of Avignon; at the end of the loop, the compost will be used by the schools who implemented a vegetable garden or by the municipal green areas. The schools will be made aware of the issues about food waste and its reduction.

Photo 2 & 3: The industrial washer in action: used for hygienically cleaning the stainless steel food containers from public kitchens (Source: L'EntrePôt)

A direct composting of bio-waste originating from school-food offers the opportunity of a truly circular economy approach towards school food. Ultimately, the fields of application can also become the sites for food production (vegetables, grain, fruit etc) where the very food that is being consumed by the (same!) schools that participate in the programme can grow. The approach also points at the opportunity to teach children about types of bio-waste and its effects on the organic matter and fertilizing effects for soils.

Photo 4: Food waste to be processed into compost (Source: DownToEarth/iStock)

5. Conclusions

Cooperating closely with nine FoodSHIFT Acceleration Labs (= living labs) in an effort to support, guide and facilitate the innovation process at the level of municipalities and their surrounding city regions has offered a wealth of opportunities for better understanding the mechanisms of food system transition. As Innovation Managers we received unique insights in the delicate relationships between innovators in business, governance and civil society organisations. These relationships have been particularly sensitive under the influence of driving forces such as the COVID 19 pandemic crisis and the Russian war against Ukraine with its wide range of geo-political and -financial knock-on effects.

Having launched a process of systematic maturing, combining and upscaling of innovation, we identified the following characteristics for food system innovation:

- In most cases, innovation processes are **non-linear**, this means they are not undergoing a steady process of upward improvement.
- Dynamic food systems which are constantly subjected to changing **driving forces** (see Fig 1) as well as market and lifestyle changes.
- Transformative nature of innovations actions means that there are no **baseline references** (= lack of historical data for comparison).
- Each city region is different in terms of socio-economic and policy make-up (no 2 city-region food systems are the same) requiring **tailor-made solutions**.

As described in this Innovation Brief, conventional methods of monitoring that rely on statistical data are not suitable for this early transformation phase of the food system. One of the characteristics of innovation is the unpredictability of many factors both within the innovation process (e.g. technology or behavioural patterns) and outside of it – e.g. driving forces affecting the innovation process such as energy prices or politics. Ultimately, the push-factor citizen engagement is also dependent on such driving forces and can change as in the example of inflation affecting consumer behaviour. Monitoring innovation hence also means to adequately take into account system dynamics affecting innovation as well as the human factor of the actors involved. Rigid quantitative approaches do not offer the type of regular feedback loops that encourage collaboration and allow stakeholders to respond in an agile way to rapidly changing food ecosystems. However, exactly this agility is essential to achieve the transformative goals set out by the EU.

The FoodSHIFT2030 project demonstrated an approach towards monitoring the innovation as a co-creation process that allowed all participating partners to take a new look at their role in the transition and discovering new opportunities. Starting off with three essential sets of references, namely the systematics of innovation readiness levels, the narratives of the MICRA inventory and the system-analytical view on innovation categories, we entered an iterative process of innovation monitoring by means of the helicopter view on the one side and the innovation case 'deep dive' on the other side. It is just the combination of these two perspectives which helped us to understand singular stakeholder interventions as part of a bigger picture of system transition.

By doing so, the routine exercise of regular checkpoints has become part of the innovation process as this allowed all partners to critically reflect on the achievements as well as on the obstacles. In a next step, we will expand upon further aspects of monitoring at the level of the Food Innovation Ecosystem – e.g. by demonstrating a geo-based holistic approach involving the wider foodshed of city regions as well as the mapping of food transition agents as part of a circular economy network.