Report on Mapping Results

DELIVERABLE 2.1 –

PARTNERS INVOLVED:

INRAE, FoodDrinkEurope, ANIA, FIAB, Congricoltura, FZJ, EFFoST, ICLEI, Cariplo, PHILEA and SeAMK

Funded by the European Union

foodpaths

D 2.1

Report on Mapping results

Document ID	D2.1
Due date	30 April 2023
Submission date	M11
Dissemination level	Public
Work package	WP2
Author(s)	Hugo De Vries, Mechthild Donner, Flavia Fabiano, Maurine Mames, Jonas Lazaro Mojica, Françoise Gorga, Eduardo Cotillas Provencio, Concha Avila, Daniele Rossi, Tancredi Marini, Elisabetta Pierantoni, Frank Hensgen, Nikola Hassan, Jeroen Knol, Anna Bruen, Johanna Vordemfelde Valentina Amorese, Sara Scalabrin, Giulia Lombardi, Allison-Marie Loconto, Renée van Dis, Mireille Matt, Amu Palomaki, and Terhi Junkkari
Document version	Final version (fv)

Grant agreement	101059497	**Duration**	42 months
Start Date	June 2022	**End date**	November 2025

Funded by
the European Union

Contributors

Name	Organisation
Hugo de Vries, Mechthild Donner, Flavia Fabiano, Maurine Mames, Allison-Marie Loconto, Renée van Dis, Mireille Matt	INRAE
Jonas Lazaro Mojica	FoodDrinkEurope
Françoise Gorga	ANIA
Eduardo Cotillas Provencio, Concha Avila	FIAB
Daniele Rossi, Tancredi Marini, Elisabetta Pierantoni	Congricoltura
Frank Hensgen, Nikola Hassan	FZJ
Anna Bruen, Johanna Vordemfelde	ICLEI
Valentina Amorese, Sara Scalabrin	Cariplo
Giulia Lombardi	Philea
Amu Palomaki, and Terhi Junkkari	SeAMK
Jeroen Knol	EFFoST

Revision history

Version	Date	Reviewer	Modifications
1	14/2/2023	INRAE team	Preparing the deliverable and its content
2	27/2/2023	INRAE team	First input to deliverable report; alignment with MS3; requests send to WP3,4,5 and 7 for their results
3	20/2/2023	Workshop participants	Incorporating recommendations based on discussions in Workshop 'Mapping results', 20/3/2022
4	24/2/2023	INRAE team	All WP3,4,5 and 7 contributions received, reviewed and incorporated in Deliverable
5	29/2/2023	Project coordinator	Review of full deliverable draft 1
6	22/4/2023	EXCOM	Final review

Funded by the European Union

Table of Contents

Funded by
the European Union

List of Figures

List of Tables

Funded by the European Union

1. Executive summary

This deliverable presents mapping results of WP3,4,5 and 7, summarized in WP2 which provided the template and instructions for carrying out the mapping studies. This has been presented and discussed during the kick-off meeting at the workshop 'mapping results'. The main objective of this report is to give an overview of existing developments in food systems in Europe and to allow the selection of exemplary experiences, to offer the future Partnership Consortium a 'vitrine' with best practices and lessons learned from co-creation cases.

The mapping studies have been carried out in the different WPs according to their focus and objectives: in WP3 regarding funders and their strategies, in WP4 targeting co-creation cases by private and private-public actors, in WP5 addressing exemplary university-driven sustainable campuses, and in WP7 focusing on networks, platforms, and partnership cases in Europe.

All WPs have drawn from common definitions of key concepts to carry out their mapping studies. Then, the different WPs developed specific methodologies to complete their tasks. WP 3 has created a network and a map of funders through three different waves of consultation and the submission of a survey. WP4 and WP7 have collected emblematic case studies of co-creation with direct links to the activities of their partners, using a template following the "Game" framework as defined in Milestone 3. Finally, WP5 has mapped universities that are either leading in the field of agriculture and food sciences and/or leading in environmental and social impact by crossing information from three internationally recognised ranking databases.

WP3 mapped 40 funding organizations, which answered the survey and agreed to be part of the FOODPathS funders Network, and analyzed their geographical spreading, research focus, and institutional characteristics. WP4 and WP7 collected respectively 52 and 26 co-creation case studies, characterized by a rich diversity of aims, geographical spreading, the scale of implementation, actors involved and type of activities. Their approaches and results in terms of the sustainability of food systems are discussed. Finally, WP5 allowed a first overview of European universities' efforts in terms of contributing to food systems' transformation, which appear to be widespread in all EU member countries.

The mapping results allow arguing that thinking and acting for food systems sustainability is a widespread practice in Europe. A large number of initiatives in Europe tackle themes concerning food and sustainability through a wide diversity of angles and with the joint implication of multiple groups of stakeholders. At the same time, only some of the case studies openly refer to the concepts of "food system" and "food system approach". Further in-depth research on selected case studies is needed to clarify to which extent food system approaches are practiced in Europe.

The report recommends using the mapping results as: a guide to select a limited number of case studies for in-depth analysis; a source of lessons learned for different stakeholders' engagement; a source of first indications for structuring the themes of the Prototype Partnership SFS.

Funded by the European Union

2. Introduction

FOODPathS aims to design a prototype for the future Sustainable Food Systems (SFS) Partnership in Europe. A key element will be the presentation of exemplary case studies, providing best practices and lessons learned for the successful design of future initiatives. In order to identify such case studies, the project has conducted broad mapping studies presented in this deliverable, concerning past and existing initiatives taking place within the framework of sustainability transitions in the food systems in Europe. Such study has been carried out in the different WPs according to their focus and objectives, which are graphically shown in figure 1: in WP3 regarding funders and their strategies; in WP4 targeting co-creation cases by private and private-public actors; in WP5 addressing exemplary universities; and in WP7 focusing on public and sustainable procurement cases in Europe but also globally. The leaders of each WP and relevant tasks have drafted their contributions in this report with contributions from other WP partners and within an overall coordination and drafting of common parts by WP2, task 2.1.

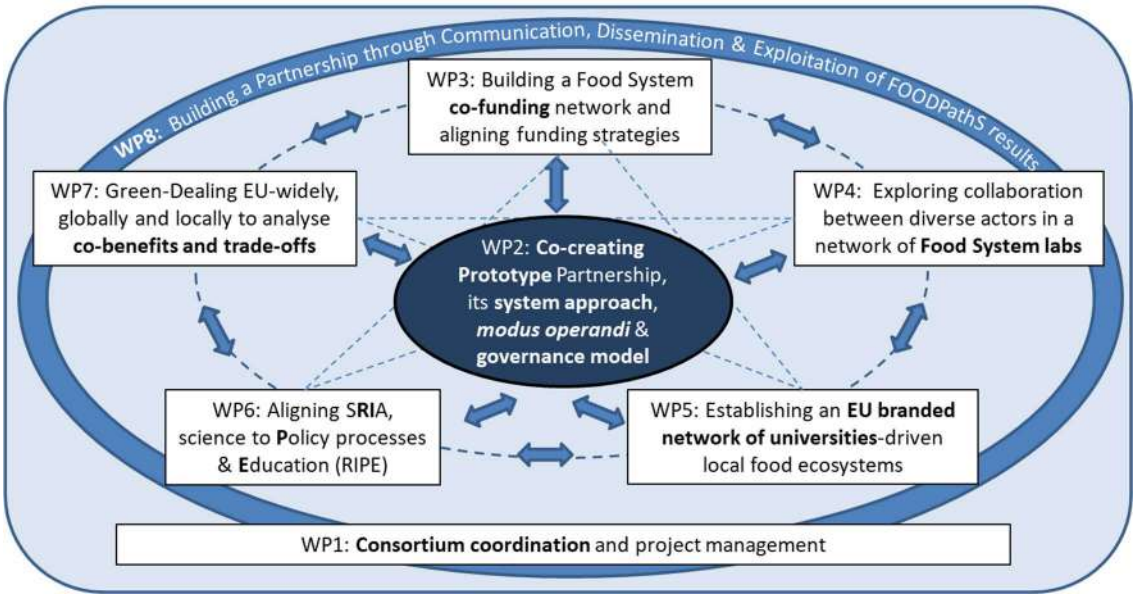

Figure 1: Project structure in WPs following a systems approach and co-creation processes

The mapping studies have not attempted to provide an exhaustive account of all existing experiences, as such an exercise would have required efforts that fall well beyond the scope of this project. Instead, the different WPs have developed specific methodologies – which are outlined in section 5 - to provide an overview of existing and emerging activities with a different focus – which is presented in section 6. Then, an overall analysis of the results of the mapping studies and the formulation of recommendations for the selection of some in-depth case studies and further analysis are presented in sections 7 and 8, respectively.

3. Objectives of the deliverable

The main objective of this report is to give an overview of existing trends in food systems, concerning: funders and funding strategies, public-private co-creation cases, university-driven initiatives, and public and sustainable procurement. This overview will allow selecting exemplary experiences to offer the future Partnership Consortium a map of funders, a 'vitrine' with best practices and lessons learned of co-creation cases, and exemplary sustainability-driven universities. These are supposed to help the future Partnership with setting funding priorities.

Table 1: Objectives and main actions implemented.

	Objectives	Main actions
1.	Mapping funders, existing co-creation cases and sustainability-oriented universities	Provide clear overview of mapping studies, their pros and cons.
2.	From individual insights towards a map and vitrine of cases and a logical structure of the report with a first analysis of mapping results	Exchange with WP leaders to incorporate their mapping results in one report
3.	Analyse the co-creation cases to prioritize a limited set of them to be studied in more detail; this to in particular understand their potential contributions towards sustainable FS outcomes	Discussion with different partners and their network
4.	Finalize the report on mapping results	Edit the deliverable
5.	Report the deliverable	Final communication by D2.1 coordinator
6.	Broadly communicating the content of the deliverable	Show some first mapping results together with WP8 on workshops and via the website

Funded by the European Union

4. Target audience

The target audiences (as defined in D8.1 of FOODPathS) for this deliverable are (i) the partners in FOODPathS, (ii) the partners of the future Partnership SFS Consortium (from 2024), (iii) the networks of FOODPathS partners, and (iv) the wider audience since the deliverable is openly accessible. Therefore, the results will be presented in a future FOODPathS 'vitrine', to be developed with WP8, and the already developed funders map. The "vitrine" may be comparable to the funders map concept but with case studies in the different countries in Europe and beyond.

Depending on the kind of mapping studies, specific target audiences are addressed, like policymakers, policymaking-supporting organisations and financers for WP3, the private sector actors for WP4, the research performers and educators in WP5, and civil society organisations, consumer organisations, citizens and consumers as well as philanthropic organisations.

The sharing of results with other related partnerships and coordinators of other funded projects will not be specifically sought. This will become more relevant for the selected limited number of in-depth case studies.

Funded by
the European Union

5. Methods

5.1. Definitions of key concepts in Food Systems

There are several key concepts used in Food Systems and for this deliverable, for which definitions were needed. Here we propose operational definitions of four key concepts, which will be further developed in future deliverables. Two of these definitions (those of co-creation and case studies) have been drafted in Milestone 3 and presented in the related workshop during the Kick-Off meeting.

Food system approach

During the last 20 years, an increasingly large community of scientific scholars, civil society activists and policymakers have been proposing to tackle problems such as food and nutrition security, rural livelihoods and environmental sustainability through a food system approach. Among numerous available definitions[1], FAO (2018) defines the food system approach as:

A way of thinking and doing that considers the food system in its totality, taking into account all the elements, their relationships and related effects. It is not confined to one single sector, sub-system (e.g. value chain, market) or discipline, and thus broadens the framing and analysis of a particular issue as the result of an intricate web of interlinked activities and feedbacks. It considers all relevant causal variables of a problem and all social, environmental, and economic impacts of the solutions to achieve transformational systemic changes.

According to Halberg and Westhoek (2019, p.3), key elements of the food system approach are:

- *A food systems approach attempts to understand the natural, technical, economic and social aspects of several interlinked activity areas from primary agriculture including crop and livestock production and their inputs, yields and emissions to logistics, processing, transforming and packaging of food to marketing, consuming and disposing of waste and the linkages between these elements.*
- *A food systems approach should improve the understanding of the interdependencies between key parts of food systems at various scales (complexity) and the desired and un-desired outcomes in terms of food, health, environmental and climate impact etc. It would help to identify systemic lock-ins, feedback loops and trade-offs and could pinpoint synergies in terms of changes in one part, which may reinforce positive changes in other parts or outcomes. It will help to create a shared understanding amid complexity, as a basis for coherent action.*
- *A food system approach towards Research and Innovation integrates the bio-physical focus with an actor-based approach, which enables scientists and other actors to address both the 'what' questions as well as the question 'how' changes and larger scale transformation can be realized.*
- *A food system approach can be applied at various scales, ranging from local to European to global scale. It can also be applied at either more integrated as well as more thematic issues. A food system approach would require that - part of - the research should be interdisciplinary or transdisciplinary as well as promote multi-actor collaboration.*

[1] For example see: Allen & Prosperi, 2016; Ericksen, 2008; HLPE, 2017; van Berkum et al., 2018

Such an approach indicates that driving change in the food system requires simultaneous and coordinated policy action addressing synergies and trade-offs across the system. For example, to shift towards more plant-based diets, not only production needs to make sure that the relevant foods are available and appealing. Also, the consumers should be willing, able and knowledgeable about how to prepare attractive meals with these foods. Finally, this should be compatible with the necessary cultural and social parameters corresponding to their circumstances (European Commission. Joint Research Centre, 2022).

Co-creation

In scientific literature, different definitions of co-creation have been given (Galvagno & Dalli, 2014; Ind & Coates, 2013; Voorberg et al., 2015). Here, we define co-creation as follows: *co-creation refers to the design process of a 'product' or 'service' in which input from a group of different actors – which may or may not include consumers – plays a central role from beginning to end.*

Living lab

The Living Labs for Food System (FSLL) are collaborative approaches to foster innovation and its adoption in the food system. Since the food system itself and the related challenges are complex, different FSLLs can be targeted to achieve specific objectives within the food system.

The key elements of FSLL can be summarised as follows (from EnoLL website and Vervoort et al., 2022):

- testing and evaluation of concepts, products, services, procedures, and systems in real-life communities and settings - that is crucial to being a living lab;
- multi-method approach;
- multi-stakeholder participation;
- active user involvement and participation, user engagement is not just a matter of asking for feedback from stakeholders but doing this together with the user;
- co-creation – systematic use, developing innovation through co-design with all actors in particular by users, manufacturers and service providers;
- orchestration - management and facilitation of the activities by a responsible person or management team.

The mapping studies test the concept of a living lab, broadly considering it as the direct environment where co-creation (defined as above) takes place.

Case studies

Case studies, following a co-creation approach to reach sustainable outcomes for food systems, will have a central role in the CSA project FOODPathS and in Europe in general (e.g. SAPEA, 2020), because they:

- allow analysing case-specific and -generic results, contexts or playing fields, actors, actions, constraints, resources and evolutions in time;

- may give rise to snowball effects to reach more rapidly sustainable outcomes all over Europe,
- may motivate others in Europe to follow their example,
- may avoid wasting time & money in case of repeating worst cases.

For example, there are co-creation cases in SFS domains oriented to:

(i) Sustainable outcomes coherently for the three dimensions of sustainability at a well-defined, often local scale (hence, social, environmental and economic dimensions);
(ii) One-dimension improvements or 'added-value' outcomes at both local and global scales (e.g. introducing a water-saving technology in a food value chain);
(iii) Global issues like e.g. global fluxes or trade evolutions.

Many different groups of actors and their objectives can be distinguished, for example:

- Public actors that are co-creating an agenda for research with joint calls;
- Private actors that are co-creating an eco-industrial park to more efficiently use resources like water or energy;
- Public-private partnerships that form a cluster to make a protein transition happen;
- Foundations that are supporting the 'non-usual suspects';
- Citizen initiatives that are co-creating sustainable diets based on local garden products;
- A global network of regional initiatives that are transforming trade-offs into co-benefits;
- A global network of communities
- Universities that are co-designing experimental food system science teaching programs to make their exemplary sustainability-oriented campus a reality;
- Research centers that are developing R&I agendas for SFS;
- Others.

5.2. Methodology for WP3 mapping studies

The main objective of WP3 is to enable a transformation from established funding schemes and designs towards more co-creation-based funding approaches respecting the needs of public authorities as well as the chances of open engagement with relevant stakeholders following the idea of a systems approach. For this Deliverable, task 3.1 is of specific relevance: "Map public and private co-funders differently engaged with SFS to set the basis for the future funders network of the Partnership (PS)".

In this framework, the WP3 mapping studies have consisted of the assembly of contacts, experiences and expectations achieved through the Funders Forum dialogues and conducted interviews with funders, as well as the mapping of public and private potential co-funders and developing an engagement scheme for those funders.

The methodology used by WP3 for creating the network and map of funders comprised several waves of e-mails, inviting funders to fill out a survey to become part of the map and network of funders. In the first wave, partners from associated networks from the WP3 team itself were contacted. For the second wave a list of contacts provided by the SCAR Strategic Working Group Food System was used. The third wave engaged the FOODPathS network partners and a fourth wave was achieved by reaching out to all broader contacts such as advisory boards of networks and similar.

The survey includes an explanation of the Network of funders as well as the map of funders and asks for the following information: details on an organisation (name, website, country, contact person), organisation type, level of funding (geographically), source of funding, funding priorities with regard to Sustainable Food Systems, subtopics / keywords of funding themes, logo, approval for joining network and/or map. The survey was launched at the end of September 2022 and still remains open at the link https://www.surveymonkey.de/r/FOODPathS_Funders.

5.3. Methodology for WP4 and WP7 mapping studies

WP4's main goal is to explore collaboration between diverse actors in a network of Food System labs, while WP7 is designed to make sure that the future SFS Partnership is inclusive, considers trade-offs and develops meaningful synergies in and outside Europe by learning from and cooperating with existing networks and partnerships.

In this framework, case studies of WP4 and WP7 followed a common methodology and consisted of the collection of cases directly connected to WP4 and WP7 partners' expertise and networks and following criteria and keywords outlined in section 5.3.1. The "Game" framework, outlined in section 5.3.2, allowed the elaboration of a template for collecting examples of cases. Also, it allowed a first level of categorization and analysis of cases presented in section 6.

5.3.1. Keywords & Criteria for selection of cases

In order to select an appropriate set of co-creation cases on food systems, the following set of **keywords** has been proposed as a guide (see Figure 2 below).

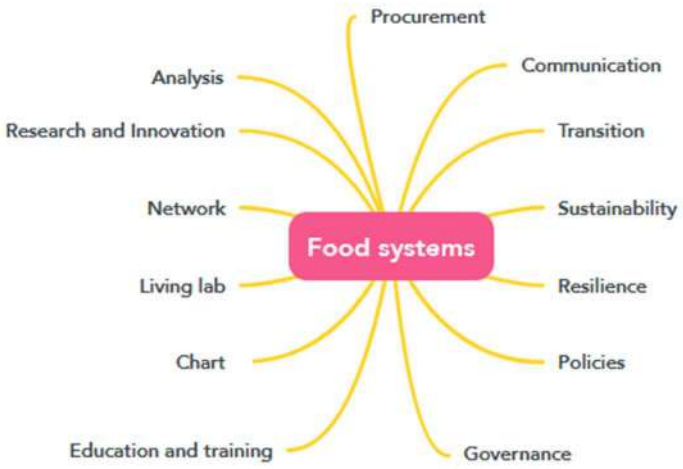

Figure 2: Keywords used for selecting a set of co-creation cases on food systems

Also, the following criteria for selecting cases have been proposed:

- Temporal criteria: none
- Geographical criteria: cases can be local, regional, national, bi-national, European, or global
- Operational criterion: providing suggestions for the development of the future Partnership SFS.
- Content-specific criteria:
  - adopting an FS approach and based on co-creation (either implicit or explicit).
  - Targeting the post-harvest phase.
  - Considering representative and illustrative cases for FS striving for sustainability.
  - Considering various building blocks of the GAME, thus of the food systems.
  - Building on interdisciplinary research, innovation, policy and education strategies.
  - Adopting a multi-stakeholder approach and participatory methods of research.
  - Providing novelties (theoretical, methodological, technical; relevant for others).
  - Providing new indicators of impact, sustainability, and resilience.
  - Developing scenario analyses.
  - Creating new datasets or inventories.
  - Sourcing of available and accessible results.

5.3.2. Framework for case studies

A framework has been developed to map and analyse cases on basis of the structure of a GAME. Why a GAME structure? All people have presumably once played a game, hence realize that there is always a:

(i) a playing field: the food-actors' environment, not only geographically but also culturally or socially;
(ii) the players: diversity of actors in food systems, like farmers, or universities, or policy makers;
(iii) the pieces: resources, food products, services, reports, guidelines, curricula…;
(iv) moves: handling of food such as production, transformation, distribution, consumption or usage, recycling OR project call procedures, or participatory approaches or debating sessions;
(v) rules: food regulations, subventions, code of conducts, boundary conditions for call's;
(vi) the time: duration of activities in food systems like innovations or settling policy measures, or subvention schemes, developing sustainability charts;

(vii) the outcomes, that are generally expressed as 'win' or 'loose'; for FS, this means 'sustainable' or 'unsustainable' (e.g. (un)sustainable outcomes of living lab experiments, no interest for calls, chart not adopted, unforeseen trade-offs or (positively) surprising benefits…).

These are the seven building blocks of a game. The same holds for food systems. A schematic representation of the FS-Game structure is presented in the following Figure 3.

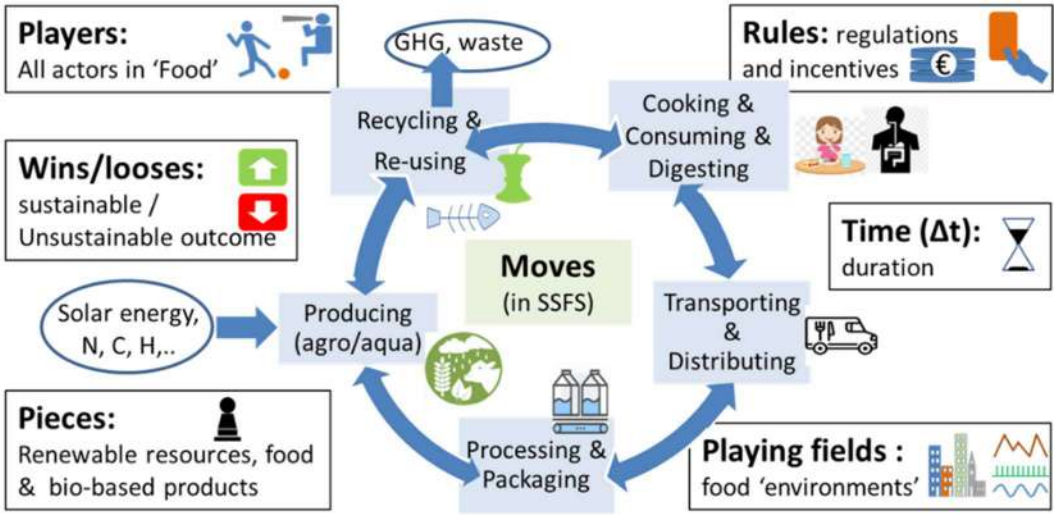

Figure 3: The seven building blocks of a Food System (analogy with a game); modified from de Vries, Donner, Axelos (2022))

5.3.3. From Game Structure to Template

Next to the structure of a GAME, there have been the following elements that needed to be briefly[2] described in a case study in order to understand its evolution and dynamics:

- The history of the case;
- Its main characteristics;
- The interactions between the actors in the case,
- The behaviour of actors in the case with respect to potential sustainable outcomes.

The here proposed one-page TEMPLATE served to collect examples of cases (see Figure 4 below). For each case, the template was filled in.

[2] This will be more extensively done in the limited number of selected cases in the next phase of the FOODPathS project.

Funded by the European Union

Name of the food systems co-creation case / Country .....
One or two key features: .....
Status (starting, running, on-hold, stopped): .....

Photo banner (including country)

DESCRIPTION

History of co-creation between actors: .....
.....

Which ambitions and objectives: .....
.....

Evolution of their governance model and organisation: .....
.....

What external input and output: .....
.....

An illustration
(Product, service,
organisation change, ...)

The seven Food System building blocks (like in a *GAME*):

Food context (playing field)	**Food Actors** (players)	**Products** (pieces)	**Food handling actions** (moves)	**Boundary conditions** (rules & incentives)	**Results** (outcomes regarding sustainability)	**Timing of actions** (duration)

FOOD ACTORS: what are their roles, how do they interact, and what are then their common objectives (max 3)

Actor's strength (what specific skills, or competences, or assets or are provided?)	**Flexibility of actor** (is an actor adapting to others in this case and how?)	**Interactions between diverse actors** (do actors form a cluster, network?)	**Common focus as 'cluster' of actors** (do actors jointly define a goal(s)?)	**Joint objectives with other 'clusters / FS'** (do clusters work with others?)

Some words about the sustainability behaviour of actors
(e.g. their willingness to take action, their new decision making processes to incorporate sustainability, their perceptions about their responsibility in the sustainability transition, their own impression about their level of impact (ratio benefits/trade-offs), ...)

.....
.....
.....
.....
.....

Main sources: .....
Contact person: .....

HorizonEurope CSA FOODPathS; WP .....

Funded by the European Union

Figure 4: The Template used for case studies

5.4. Methodology for WP5 mapping studies

The goal of WP5 is to establish a branded network of EU university-driven local ecosystems to foster Food2030-inspired FS transitions. This branded network of European universities should motivate the organisation, staff, and students to foster Food 2030-inspired food system transition for co-benefits relevant to their internal corporate practices, local and regional communities. It is therefore more than only having a strong SFS curriculum, but also about corporate practices (gender equality, sustainable food, packaging, waste, biodiversity policies) and their role in local and regional communities by for instance aiding spin-offs, involving local producers and citizens.

Different databases and rankings have been used to identify and map universities that are either leading in the field of agro and food technologies and/or leading in environmental and social impact (see Figure 5). Among these, W5 partners choose:

- Shanghai Ranking – Global Ranking of Academic Subjects (GRAS)
- UI GreenMetric World University Rankings
- QS Sustainability Rankings

Figure 5: Visual representation of ranking databases

Shanghai Ranking – Global Ranking of Academic Subjects (GRAS)

Shanghai Ranking began to publish world university ranking by academic subjects in 2009. By introducing improved methodology, the Global Ranking of Academic Subjects (GRAS) was first published in 2017. The 2022 GRAS contains rankings of universities in 54 subjects across Natural Sciences, Engineering, Life Sciences, Medical Sciences, and Social Sciences. More than 1,800 out of 5,000 universities across 96 countries and regions are finally listed in the rankings.

The GRAS rankings use a range of objective academic indicators (see Table2) and third-party data to measure the performance of world universities in respective subjects, see table below. The index of international academic awards is based on Academic Excellence Survey (AES) conducted by Shanghai Ranking since 2017.

Two of the Shanghai Ranking by academic subjects have been included for the mapping exercise in WP5 namely:

- Life Sciences – Agricultural Sciences
- Engineering – Food Science & Technology

There are 500 universities in the 2022 ranking on Agricultural Sciences, of which 166 universities are from Member States, and 49 from Associated Countries. There are 300 universities in the 2022 ranking on Food Science & Technology, of which 105 universities are from Member States, and 17 from Associated Countries.

Table 2: The 5 indicators of the Shangai Ranking 2022

Research output (Q1)	The number of influential journal publications is an important measure of the research output of the universities in the corresponding subject. Q1 is the number of papers published by an institution in an Academic Subject in journals with Q1 Journal Impact Factor Quartile during the period of 2016-2020. Only 'Article' is considered. Data are collected from Web of Science and InCites.
Research influence (CNCI)	Category Normalized Citation Impact (CNCI) is the ratio of citations of papers published to the average citations of papers in the same category, the same year and same type of journal publication, by an institution in an Academic Subject during the period of 2016-2020. A CNCI value of 1 represents world-average performance. CNCI less than 1 indicates that the citation times of this group publications are lower than the average level, while CNCI greater than 1 indicates that the paper's citation performance is above the average level. Only 'Article' is considered. Data are collected from InCites database.
International collaboration (IC)	International collaboration (IC) is an indicator used to evaluate the level of IC in the respective subject between institutions. The ratio of the number of publications that have been found in at least two different countries in addresses of the authors to the total number of publications in the respective subject for an institution during the period of 2016-2020. Only 'Article' is considered. Data are collected from InCites database.
Research Quality (Top)	Top is the number of papers published in Top Journals in an Academic Subject for an institution during the period of 2016-2020. Top Journals are nominated by distinguished scholars through ShanghaiRanking's Academic Excellence Survey . In 2022, 180 top journals identified by the Survey are used in rankings of 52 Academic Subjects. In Computer Science & Engineering, 31 selected top conferences are also taken into account this year. Only 'Article' is considered for this indicator. But in the subject of Pharmacy & Pharmaceutical Sciences, both "Article" and "Review" are counted because only one journal in this subject was selected as the Top journal and it mainly publishes reviews.
International academic awards (Award)	Award refers to the total number of the staff of an institution winning a significant award in an Academic Subject since 1981. Staff is defined as those who work full-time at an institution at the time of winning the prize. If a researcher retired at the time of winning the award, we count the institution where the researcher's last full-time academic position was held. The significant awards in each subject are nominated through ShanghaiRanking's Academic Excellence Survey.

UI GreenMetric World University Rankings

The UI GreenMetric World University Ranking is a ranking on green campus and environmental sustainability initiated by Universitas Indonesia in 2010. Through 39 indicators in 6 criteria, see Table 6 below, UI GreenMetric World University Rankings prudently determined the rankings by universities' environmental commitment and initiatives. UI GreenMetric World University

Ranking ranks universities based on their self-assessed input for the criteria set and independent research and survey responses conducted for the UI GreenMetric World University Ranking. There are1050 universities in the 2022 edition, of which 144 universities are from Member States, and 117 from Associated Countries.

Table 3: The 6 criteria of the UI GreenMetric World University Ranking 2022

Setting & Infrastructure – 15%	Basic information of the university policy towards green environment. Include space for greenery and in safeguarding environment, as well as developing sustainable energy.
Energy & Climate Change – 21%	The university's attention to the use of energy and climate change issues. Universities are expected to increase the effort in energy efficiency on their buildings, nature, and resources.
Waste – 18%	Waste treatment and recycling programs are major factors in creating a sustainable environment. Universities must take note on its waste production as well as recycling efforts.
Water – 10%	Universities are expected to decrease water usage, increase conservation program, and protect the habitat. This may include water conservation program and piped water usage.
Transportation – 18%	Universities policies in limiting the number of motor vehicles in campus, the use of campus bus and bicycle to encourage a healthier environment and reduce universities carbon footprint
Education & Research – 18%	University effort in creating and supporting the new generation concern with sustainability issues.

Best practices that are reporting in the UI GreenMetric assessment are being reporting as papers in the Journal of Sustainability Perspective. Two examples of best practices of European universities are highlighted below.

Case example: Evaluation of the carbon footprint of the Study and Information Centre of the University of Szeged (Hungary)

The Study and Information Centre is one of the largest and most frequently visited main buildings of the University of Szeged. The CO2 calculation was conducted according to the Bilan Carbone method, and all three scopes (direct emission, energy consumption, supply chain) were covered. Data collection used for the evaluation contains information for all three scopes (fuel combustion, company vehicles, fugitive emission–purchased electricity, heat, and steam –purchased goods and services, business travel, waste disposal, transportation, investments). In the process of data collection, the eating habits, selective waste collection and travelling methods were covered in a visitor/employee survey as well.

These results provide a basis for further carbon reduction investments, protocols and events held for shaping the visitors' and employees' consciousness.

L. Gyarmati, 2022

Best practices in greening transportation at Wageningen University & Research

Wageningen University & Research (WUR) has sustainable development as a fundamental philosophy. Besides operationalising sustainable development in education and research, WUR also regards sustainability as an important principle in its operational management. Promoting and achieving sustainability is considered as a continuous and on-going process.

The Mobility Plan 2030 was implemented to bring WUR's sustainable mobility policy to a higher level. It contains a broad vision on the topic and systematically addresses all aspects of mobility. Since 2019, various actions were carried out to encourage the use of public transport and (electric) bicycles, to discourage car use, to facilitate alternatives to air travel and to make the various transport options more sustainable.

J. Luttik, and E. Maters, 2022

QS Sustainability Rankings

The QS Sustainability Ranking 2023 assesses 700 universities around the world to determine their environmental and social impact. Indicators are split into environmental sustainability measures – including sustainable institutions, sustainable education, and sustainable research – and social impact measures – including equality, knowledge exchange, educational impact, employability and opportunities, and quality of life, see Table 4.

Not all universities around the world submitted data to be included in the rankings, institutions with a strong, clear commitment to sustainable and social impact have been picked up and included regardless of their participation. There are 700 universities in the 2023 edition, of which 206 universities are from Member States, and 81 from Associated Countries.

Table 4: The 8 indicators of the QS Sustainability Ranking 2023

Environmental impact	
Sustainable institutions	Considers whether a university holds membership in officially recognized climate action or sustainability groups, has a publicly available sustainability strategy and energy emissions report, has student societies focused on environmental sustainability, and a published commitment to becoming NetZero.
Sustainable education	Looks at alumni outcomes and academic reputation within earth, marine and environmental sciences courses, and the availability of courses that embed climate science and/or sustainability within the curriculum. If a university has a research center dedicated to environmental sustainability, further points are gained.
Sustainable research	Assesses the university's research activity around the United Nation's Sustainable Development Goals and whether the government is funding research and development in this area.
Social impact	
Equality	Assesses institutions on a variety of measures including the proportion of female students and faculty, the availability of public equality, diversity and inclusion policy, and the disability support available.
Knowledge exchange	Measures universities on their commitment to knowledge transfer in collaboration with less-economically-supported institutions, and a

Funded by the European Union

	university's inclination to partner with other institutions and organizations.
Impact of education	Looks at the university's research into quality education, alumni impact and academic reputation in relevant social subjects, and how free students and academics are in pursuing their research without censorship.
Employability and opportunities	Gives each university an employer reputation score and an employment outcomes score, based on how prepared students are for successful careers. Universities are also assessed on research into work and economic growth, and peace, justice and strong institutions, as well as the rate of unemployment within the country they're based in.
Quality of life	The final social impact indicator, used to understand an institution's commitment to wellbeing within and outside of the university. We also look at research activity into quality of life, health options on campus and air quality in the region, for example.

6. Results

6.1. Results from WP3

The result of the survey for the funders map is shown on the FOODPathS homepage (https://www.foodpaths.eu/map-of-funders/) and is summarized as follows in Figure 6.

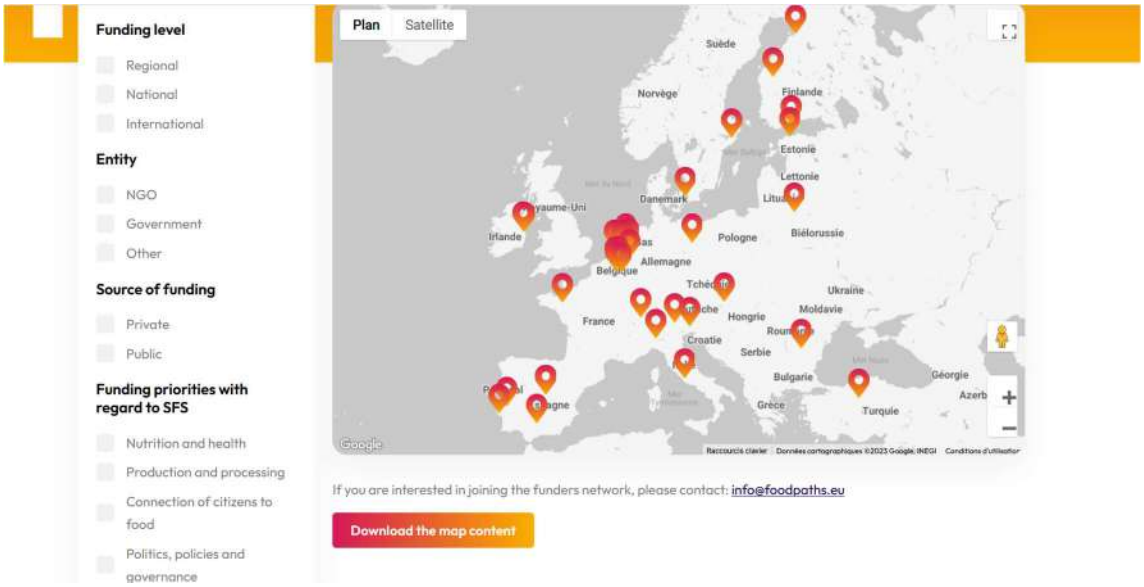

Figure 6: Funders map shown on the FOODPathS homepage (https://www.foodpaths.eu/map-of-funders/)

40 funding organizations answered the survey and agreed to be part of the FOODPathS funders Network. 37 of them agreed also to be displayed with their organizations information on the FOODPathS Map of funders. 19 countries are represented on this map, 33 governmental organizations and 4 non-governmental (incl. 6 clusters), 15 regional actors and 3 foundations.

The countries and number of entities from each country on the map are displayed in Figure 7. It shows that some countries responded very strongly to the survey, being engaged with several funding entities such as Belgium, Finland, Ireland, Italy, Netherlands, Portugal, Romania and Spain, whereas from some European countries, no funding entity agreed to be displayed on our funders map, namely Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Greece, Hungary, Latvia, Luxembourg, Malta, Poland and Slovenia.

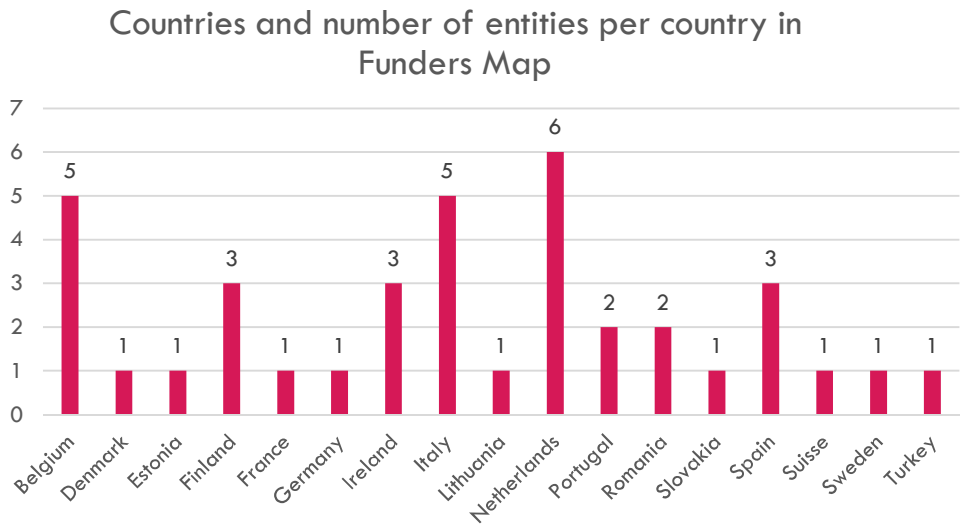

Figure 7: Countries and number of entities per country displayed in the funders map

Figure 8 does include the funding entities with a strict regional focus. Only a limited number of regional funding organizations replied positively to the survey and are included on the map. Belgium is strongly represented.

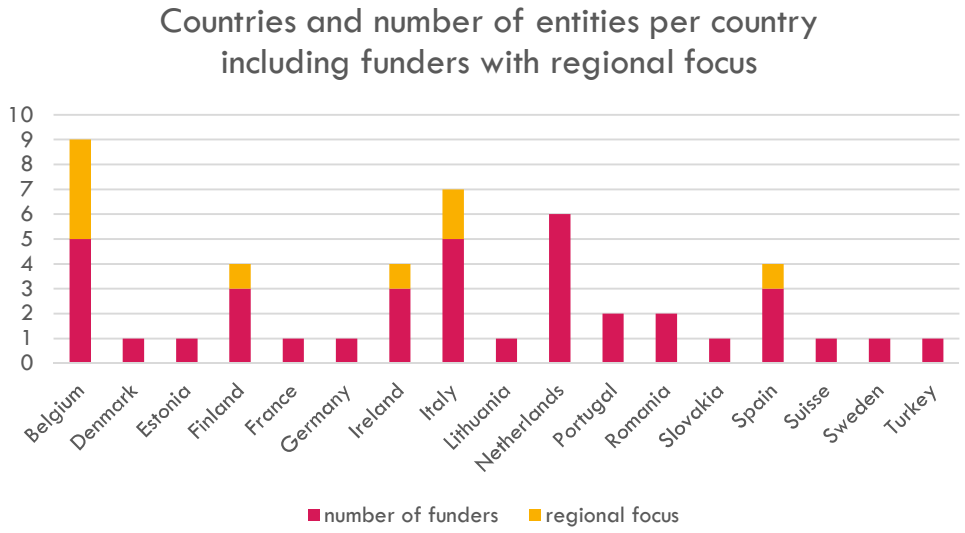

Figure 8: Countries and number of entities per country displayed in the funders map including funders with regional focus

Figure 9 shows that the most frequent organization type in the map is that of governmental organization (73%), whereas NGOs and Cluster organizations are less frequent.

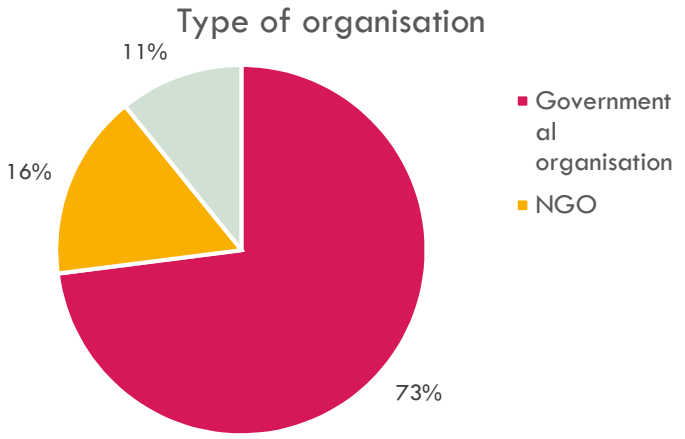

Figure 9: Type of organisations of entities displayed in the FOODPathS Funders Map

The source of funding is mostly public funding, only 10% of the entities provide private funds, which is shown in Figure 10.

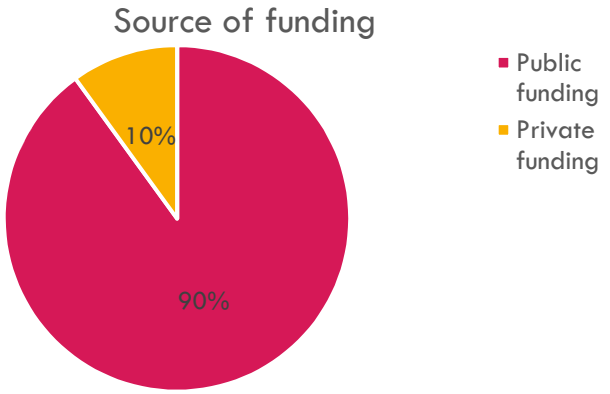

Figure 10: Source of funding of entities displayed in the FOODPathS Funders Map

Concerning the research priorities, funding organizations were asked to give their priority (high priority/ medium priority /low priority/ No priority at all) to the 4 R&I areas specified in the SRIA of the future Partnership (P-SFS SRIA, 2023). Those areas are:

- "Change the way we eat" (nutrition and health),
- "Change the way we process and supply" (production, processing and supply),
- "Change the way we connect" (consumer involvement and citizen participation)
- and "change the way we govern" (politics, policies and governance of the food systems).

The results are shown in Figure 11. The R&I Area "production, processing and supply" received the most positive feedback, being a high priority for most of the funders and for a few funders still a medium priority. No funder has chosen low or no priority for this R&I area. The second most positive feedback was received on the "nutrition and health" R&I area, with equally only

high and medium priority feedback, but a bit higher number of medium priority feedback. “Consumer involvement and citizen participation” was considered a high priority by 14 funding organizations and a medium priority by 17, but also as low priority by 4 and no priority at all by 1. A similar result was achieved for the research area of “politics, policies and governance of food systems” with a bit higher number of high priorities (20) and a bit lower number of medium priorities (11), but also 3 funding organizations with low priority and 1 with no priority at all. Thus it can be concluded that there is a high or medium interest in all 4 research areas by the vast majority of the funders answering the survey, but while two of the R&I areas had only positive feedback, the latter two R&I areas (“the way we connect” and “the way we govern”) are not prioritized by all funding organizations.

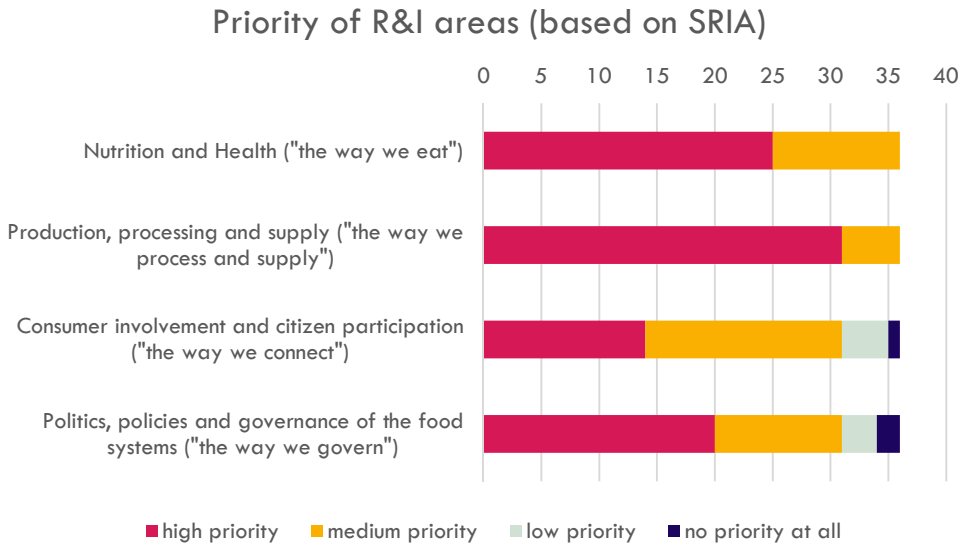

Figure 11: Priority of SRIA research and innovation areas

6.2. Results from WP4

WP4 partners mapped 52 cases of co-creation initiatives concerning food systems in Europe and characterized by an interaction between private and public actors. In order to build such a collection, each WP4 partner has presented a few cases of its own past work, chosen as emblematic examples of living lab experiences in food systems. Collected information about the cases is available in Annex 2, in the form of 52 fact sheets, using the template outlined in section 5.3 following the “game” framework. Then all cases’ names and key features, have integrally been elaborated in a table which also follows the “game” framework. This is shown for 5 examples in Table 5.

An analysis of columns “identification”, “duration”, “context” and “key actors” of the table provides some background information about the cases and shows their rich diversity in terms of geographical distribution, type of activity, actors involved and scale of implementation.

Table 5: Presentation of WP4 data processing methods, orgnaising information form the templates in a table where the columns correspond to cathegories of the "game" framework, through 5 examples of cases

Case identification info	Key objectives	Time	History/evolution	Context (playing field)	Key actors (players)	Type of products (pieces)	Activities (moves)	Strategy applied (moves)	Boundary conditions (enablers and barriers)	Sustainability outcomes
Food for life platform, technological platform, Spain	Promote the transmission of research, scientific and technological advances through public-private collaboration	since 2005	Set up by FIAB with the most important agri-food research centres and supported by Spanish administration	National (Spain).	SMEs, corporations, R&D centres, universities	Food and drinks products	Project management (individuals or consortia)	Collaboration, innovation	Private/public funding, laws, norms, competitors	more sustainable products and processes
Sustainable Food Procurement, Copenhagen, Denmark	Sustainable public food procurement	since 2001	Since 2001 the Municipality of Copenhagen works closely with the House of Food (an independent, non – commercial foundation)	Municipality (Copenhagen)	Municipality & administration, 80 large public kitchens, Suppliers, Restaurants, hotels, caterings, canteens	Organically grown foods for daily meals	Growing and processing organic food, building regional supply chains, public regulation for sustainable procurement	Legal frame setting incentives for organic procurement	procurement specification/staff knowledge & habit/Federal legislation on procurement/certification rules	increase in organic production of 70% since 2011; public procurement 90% organic; increased public and private kitchen capacities
ECOTROPHELIA, student awards for food innovation, Europe	promote entrepreneurship and competitiveness within the European food industry	since 2000	Established in France in 2000, ECOTROPHELIA expanded to a European scale in 2008	Europe	students, research centers, national federations of food industries, Food for Life platform	awards, innovative food projects	national and international competitions, the ERASMUS+ program - FEEDtheMIND	competition and networking	Competition rules; incentive of prize; collaboration among partners	Innovative products
OSAF, Observatory on Smart Agri-food, Italy	promote innovation and digitalization in agribusiness	since 2018	Established by Confagricultura with research institutions and technological firms	National (Italy)	Enapra/Confagricoltura, Polytechnic Institute of Milan, University of Brescia, agro-food companies	annual convention, data collection	Organizing workshops and producing reports	partnership, technological innovation	annual funding from Enapra to OSAF/ collaboration in the agro-food business	dissemination of incentives for digitalization in agriculture
Echt Schwarzwald, regional branding, Germany	protect the traditional natural landscape of the Black Forest	since 2008	from public initiative to public-private governance model in form of an association	local (natural park Schwarzwald Mitte/Nord)	local communities, two natural parks, farmers, butchers, restaurants and consulting agency	local quality food products	production, processing, distribution, food labelling	differentiation via labelling	public support / awareness of the characteristics of the landscape/miscommunication among brand members	preservation of the natural landscape, increase of farmers' incomes

Funded by the European Union

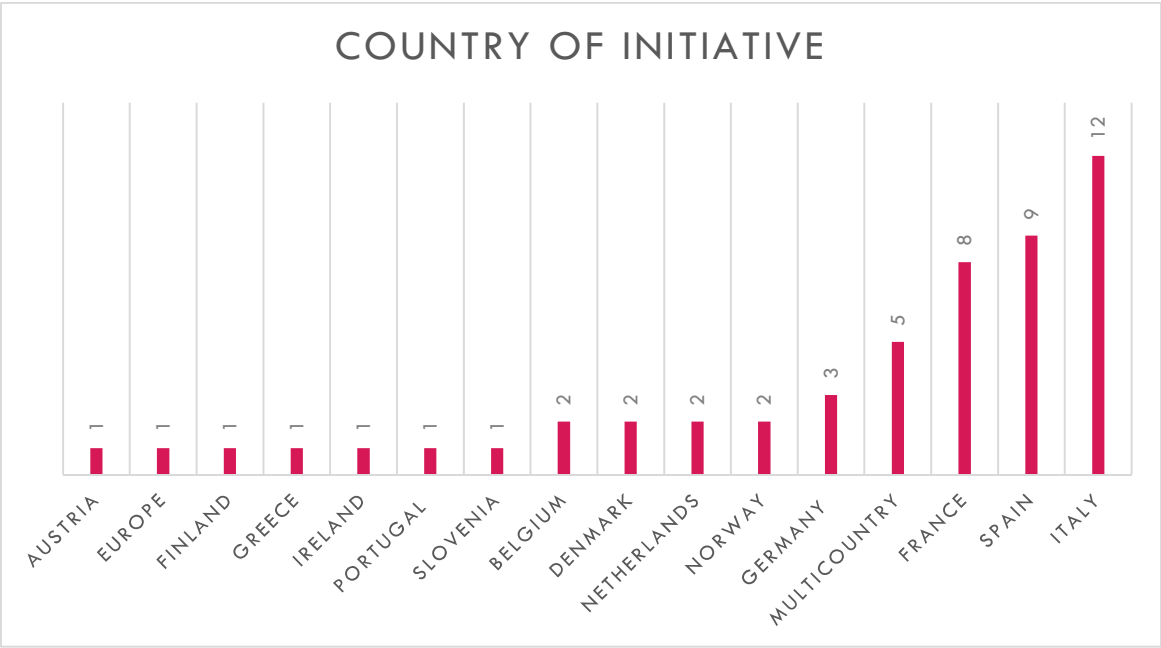

Figure 12: Number of cases per country in Europe

As shown in Figure 12, the WP4 study concerns 46 cases taking place in 14 different countries, 1 case with a European regional scope and 5 case studies in more than one country. There is a good representation of cases in Western European countries, with a high concentration of cases in France, Spain and Italy, where the project has the most partners. Instead, Eastern European cases are less represented, with only one case from Slovenia.

Funded by
the European Union

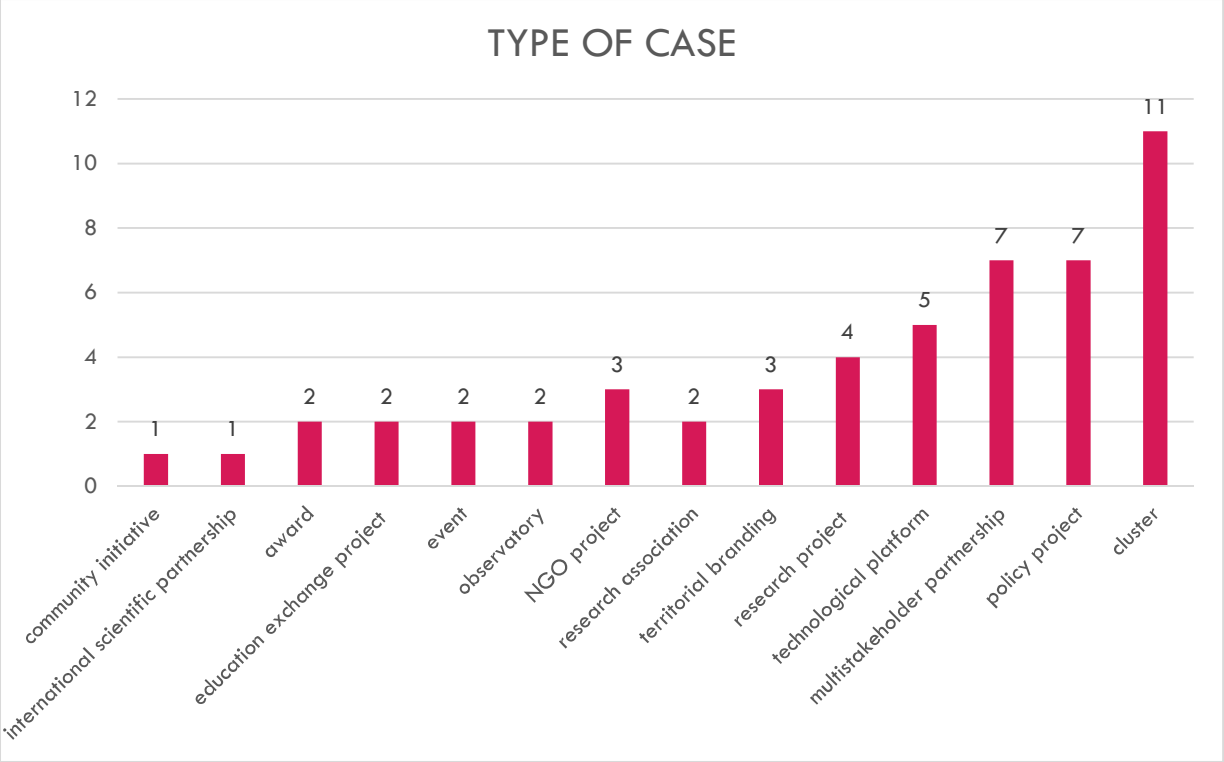

Figure 13: Distinct types of cases

Then, as shown in Figure 13, there are 14 distinct types of cases. Also drawing from the column "key actors", we see that 47% of the cases broadly concern multi-stakeholder private-public partnerships for innovation, usually associating firms and researchers in a fixed structure – in the form of either national-level multi-actor tables, clusters or technological platforms, or research association. The rest of the cases are quite heterogeneous. Around 16 cases have strong participation of public actors – like policy projects, events, awards, territorial branding, observatories – 7 cases have strong participation of research institutions – scientific partnerships, research programs and education exchanges- and 4 are characterized by the interaction with the civil society – community initiative and NGO projects (more cases with civil society engagement are mapped by WP7).

Funded by
the European Union

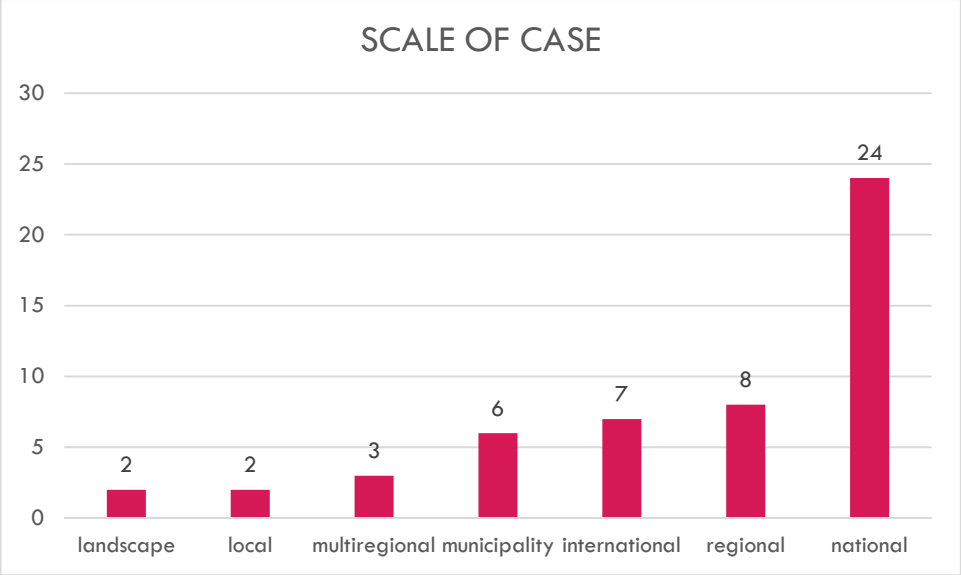

Figure 14: Geographical scales of collected cases

Then, as shown in Figure 14, collected cases concern a large variety of geographical scales, from local to international. At the same time, most of the initiatives are implemented either at a national or regional and multiregional scale.

Finally, as shown in Table 6, most of the cases concern long-term ongoing initiatives. Only 6 cases have stopped, all because they concerned projects with a foreseen end date (2 Erasmus exchanges, 2 research projects, 1 public call for proposal and 1 NGO project).

Table 6: Number of mapped cases per duration

Duration	Number of cases
long (>5y)	34
Ongoing	34
short (<5y)	18
Ongoing	12
Stopped	6
Total ongoing	46
Total stopped	6

The above described heterogeneity is also reflected by an analysis of column "products" and "activities". Figures 15 and 16 group this heterogeneity in key categories. As shown in figure 5, collected cases concern a large array of food and drink products, as well as natural resources – such as bio-energy- and non-tangible resources – such as heritage. At the same time, both figures show that collected cases hardly focus on agro-food production and transformation. Instead, most initiatives focus on the promotion of innovation and on the production of related services – such as research and data collection and analysis - as well as on building and reinforcing the partnership itself. Also, a large array of activities concerns building the capacity

Funded by
the European Union

of partnership's members in innovating, through training, but also more broadly- for e.g. in managing projects and rising funds. Finally, several cases also concern external communication activities, either through branding, but also through popularization activities aimed at spreading food and nutrition science findings among the wider public and through advocacy activities aimed at policymakers.

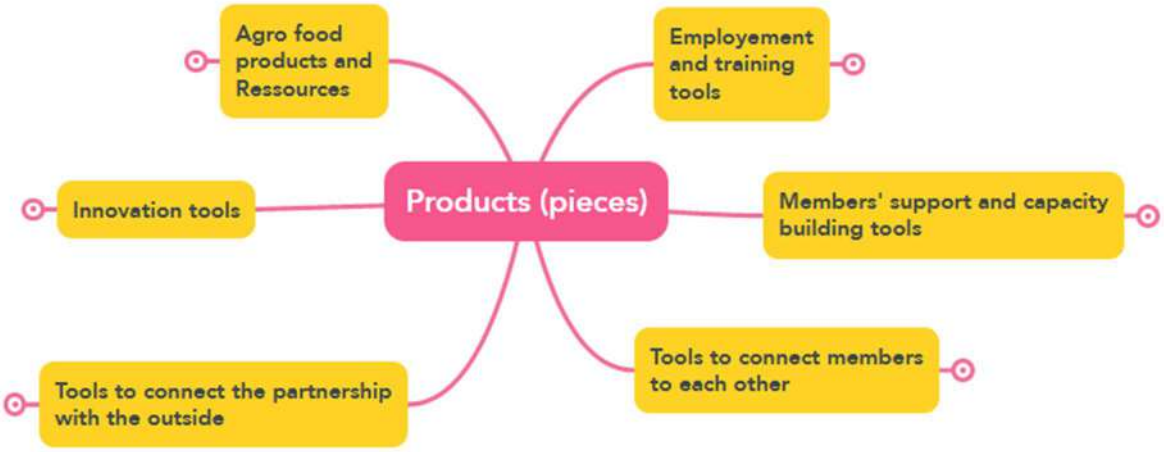

Figure 15: Products (pieces) categories of mapped cases

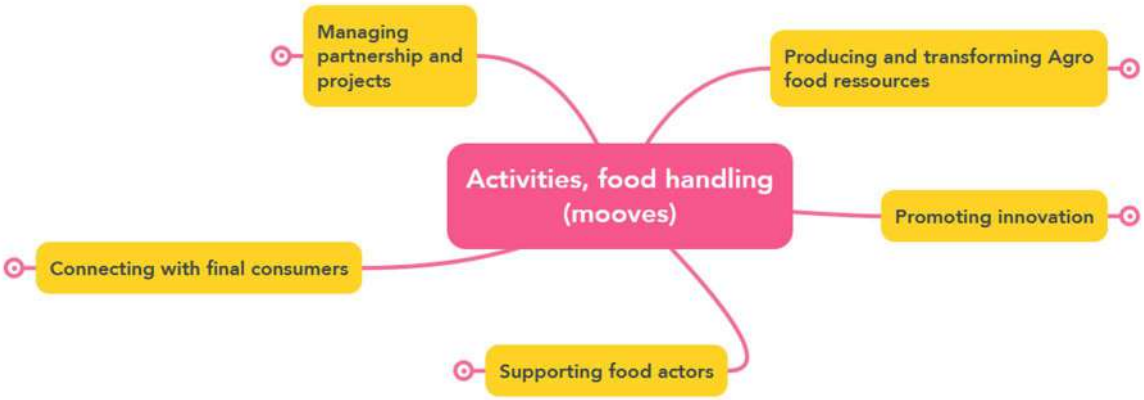

Figure 16: Activities / food handling (mooves) categories of mapped cases

Beyond the above-described rich diversity, the analysis of the column's "objectives", "strategies" and "sustainability outcomes" allows outlining of some common features and trends among the cases.

Coherently with what has been shown by the analysis of "activities", the key objectives of many cases are the promotion of innovation, education, and partnership members' support. Within the logic of these cases, innovation plays a crucial role in achieving sustainability: via research and knowledge sharing, technological advancements (process innovation, digitalization), organizational innovation (clustering, networking), and new markets or policies. Promoting innovation is then often connected to enhancing the competitiveness of agro-food companies that are partners in the case and is considered important for value creation. This focus is reflected by initiatives' strategies, which are often based on innovation or differentiation and communication, next to collaboration (networking, partnerships and clustering). Private and public-private funding is important, but less often mentioned as a principal strategy. Then, this focus is also reflected in the sustainability outcomes, where the economic dimension is frequently reported- for example in terms of increased farmer's income or long-term viability of a food sector in a region.

At the same time, social and environmental dimensions of sustainability are also addressed. Some cases do so directly – e.g. by aiming at reducing the usage of fertilizers and phytosanitary products, promoting healthier diets, and reducing food losses and waste- and other cases do so indirectly in complementary ways. For achieving environmental positive outcomes, agroecology and circular economy are used strategies. Also, environmental benefits are often mentioned as outcomes – e.g. in terms of more sustainable products and production processes- although this dimension is not expressed as the main objective. Social benefits are rarely mentioned. They concern mainly: improved health and nutrition, enhanced social cohesion and improved well-being of workers. Overall, the results lack concrete figures or details (numbers, percentages, and indicators). Instead, expressions such as 'more (sustainable), less (pesticides), increased, decreased' are often used. Further analysis of cases will be required in the next phase in order to better assess the sustainability potential of different kinds of initiatives.

Finally, in the column "boundaries" key enablers and barriers to the success of co-creation initiatives in the food systems are outlined. On the enablers' side, important factors are: social and cultural cohesion – e.g. common vision and language- organizational skills- e.g. entrepreneurship and collaboration- state legal and financial support and market opportunities. On the side of the barriers, partners of initiatives report as challenging topics the management of diversity in the partnership and the complexity of projects, as well as the achievement of the desired level of technology and innovation.

Five examples of co-creation cases

1. Food for Life, Spain

In 2005, within the European project "Food For Life", the Spanish Food and Drinks Federation (FIAB), together with the most important agro-food research centres in Spain and with the support of the Spanish Administration, founded the Spanish Technological Platform PTF4LS. This initiative was soon joined by more than 700 Spanish entities (SMEs, Research Centres, Universities, Cooperatives and all members of the Agro-food chain value). The key objective of the initiative is to promote the transmission of research, scientific and technological advances through a public-private collaboration of the main agro-food sector agents in relation with R+D+I, ensuring the competitiveness and growth of the agro-food sector in Spain. In order to reach this aim, the platform is organised into 11 working groups, where actors interact on key products – such as wine or dairy products- or on key processes in the value chain – such as quality assurance and sustainability enhancement.

2- Organic Public Procurement, Denmark

In 2001, the Danish government launched a policy to achieve 100% of organic products in national public procurement of food products. In order to achieve this aim, it partnered with the civil society organization "House of Food", in charge of organizing necessary training for kitchen staff and collective discussions and strategizing events with teachers, parents and public and private canteen users. This initiative allowed Danish public procurement to achieve 90% of organic certification so far. Moreover, there was a significant spillover effect to the private sector, whose representatives also participated in training and public discussions. Then, Denmark witnessed a wide increase of organically certified kitchens, which are 3300 in 2023.

3- Ecotrophelia, France

In 2000, the French National Association of Food Industries (ANIA), in partnership with major French Universities and High education establishments and within the framework of the European program "Food for Life", launched a training network of excellence and national food innovation competition "The Student Awards of Food Innovation". Since then, this event has showcased yearly agro-food innovations developed by top students, selected for their creativity and entrepreneurship and coached within a training program. By boosting the circulation of new ideas and projects, the initiative aims at promoting entrepreneurship and competitiveness within the French food industry. Moreover, since 2008, the program has scaled up at the European

level and has spilled over to multiple partnerships and agreements between European High education establishments and food and drink industries.

4- OSAF- Observatory on Smart Agri-food, Italy

In 2018, Confagricultura, in partnership with its research branch ENAPRA, the Polytechnic Universities of Milano and Brescia, and several private partners – such as TIM, Enel and Siemens – launched an initiative aimed at promoting the digitalization of the agri-food sector in Italy. This objective is pursued through the creation of the Observatory on Smart Agri-food, in charge of producing timely studies and reports. These analyze the composition of the market, the innovation scenarios, the dynamics of technology adoption, international trends, and barriers and bottlenecks of the primary sector.

5- Echt Schwarzwald collective brand, Germany

To countervail the decrease of the use of agricultural grazing areas and to protect the traditional natural landscape of the Black Forest, two natural parks' members, in partnership with the Ortenau community and a consulting firm, launched, in 2008, the brand Echt Schwarzwald. This initiative aims at ensuring premium prices for local producers, in particular livestock ones, involved in agro-food activities offering ecosystem services to the local landscape.

6.3. Results from WP7

Mapping studies in WP7 aim to understand the main characteristics of safe and sustainable food systems by identifying existing networks, platforms, and partnerships and their work to understand: 1) critical issues related to un-safe and unsustainable FS, and 2) successful best practices including co-operations, voluntary agreements, and policies to address them. Thus, the cases collected focus on addressing critical issues causing unsafe and unsustainable food systems. WP7 collected 26 cases, whose templates are in annex 3. In this section, we analyze this collection, which shows examples of networks, platforms, and partnerships, challenges they address, actions taken to overcome the challenges, and sustainability indicators.

We identified a range of existing networks, platforms and partnerships. Several cases were directly related to networks focusing on food policies (Milan Food Policy, New York Food Policy, Berlin Food Council) and cases of collaboration between civil society and municipalities. These networks of actors are very diverse and adaptable in terms of who participated e.g. city staff, NGO personnel, farmers, citizens, and business owners. The goal of these partnerships is mostly to influence policies or actions on food systems at local levels, taking into account the diversity of the local supply chains and their inherent boundaries. The partnerships react to the fact that a more inclusive and resilient food system relies on inclusive, fair and environmentally healthy food supply chains, meaning from production to consumption. Other partnerships occur at different points along the supply chain and were facilitated by a third actor or 'intervener.' For example, the App "ResQ" is a case, where two parts of the supply chain – supermarkets and consumers – are part of a facilitated partnership. A third type are cases looked at networks and partnerships facilitated by platforms where one agency (public or private) takes the lead and drives for action, such as the "Ellen McArthur Foundation", "4per1000" or the "One Planet Network Sustainable Food Systems Programme".

From previous experiences in the field and the available literature, we know that recurring problems causing unsafe and unsustainable Food Systems include:

1. lack of information within supply chains;
2. long supply chains that enable unjust stakeholder behavior;
3. communication difficulties along supply chains;
4. unjust access to food (overproduction versus food insecurity);
5. dependencies in the food system, including power imbalances.

Our cases confirmed these indications. In turn, we reflected on our cases how to better identify actions to overcome these issues. Our analysis reveals that there is no 'one size fits all' solution for addressing challenges in food systems. The responses to challenges in the cases we looked at were quite diverse. However, one general observation is that actions conducted by networks or partnerships are either all grounded in local contexts or try to reconnect to a local context. The "4per1000" case deals with individual farmers and foresters, "Food Policies" concentrate on one city system, the "One Planet Network Sustainable Food Systems Programme" runs interventions in different countries on a local level. The main characteristics we revealed have to do with the flexibility of the actors to adapt to the different challenges.

Each case included some indicators to help monitor progress and success towards establishing a sustainable food system. However, as mentioned, the definition of a sustainable food system varies and is used flexibly. Therefore, indicators also vary broadly and are always attached to the topic that a partnership/platform/network focuses on. Examples of indicators include the reduction of carbon emissions (see BIOCODE and Milano public procurement menus change), the

increase of organic products, and ingredients that come from regenerative agriculture or value added products from rescued food (e.g. cookies made from left-over flour from plant-based milk production, cocoa fruit pulp, or crop leftovers). Another case – the App "ResQ" on Food Waste reduction – counts the number of meals diverted from being thrown away and thus uses these numbers as indicators for sustainability. Some cases also bring in a social dimension of sustainability. Hence they propose a connection between nutritious diets within planetary boundaries and fair and just (city) societies. The case "BioCode" uses classic carbon-emission calculation as an indicator for sustainability.

The cases we collected reveal some commonalities. The majority of cases involve interactions among multiple actors in the food system - policymakers, private businesses, citizens and NGOs/Non-profits. Two primary themes that connect them are 1) healthy eating and 2) sustainability of the food system, especially related to environmental impact. However, one key finding is that there is no common definition of a sustainable food system, but rather a diverse range including qualitative as well as quantitative factors, ranging from CO_2 measurements to long-lasting "sustainable" social inclusion.

Most cases mapped were funded by public or private agencies or had the support of donations and in-kind time and volunteer labor. The activities mapped include both top-down and bottom-up initiatives. The demarcation line between top-down or bottom-up actions lies in the presence or absence of policymakers and in funding source. The top-down activities received some degree of funding from public or private agencies and included policy interventions. The bottom-up activities were often local/regional with varying funding sources, and top-down actions tend to be also international.

In addition, we noted that the better-embedded practices, or else the practices that were more successful, are also the ones in which the network of actors is more diverse. Finally, from what we were able to observe, it is important to note that for the success of the cases, a coordinator is crucial.

Three examples of co-creation cases

1. Milano Hub System

One of the priorities of Milan Food Policy is reducing food waste by engaging different local actors such as institutions, research centers, the private sector, foundations, and social actors. To translate that priority into action, in 2016, the Municipality of Milan signed a memorandum of understanding with other local actors. The aim was to reduce food waste and to innovate ways of recovering food for fragile people, designing and experimenting with a model of collection and redistribution of food surplus, based on local neighborhood networks. In 2018, the first pilot project was launched. By 2021, 3 other Hubs in the city were developed. The logistic model reveals two daily paths for collecting food surplus:

- **Supermarkets – Morning.** In the morning, the organizations in charge of the management of the Hub, collect fresh, dry and packaged unsold foodstuff from supermarkets. The recovered food is stored at the Hub and the food packages are prepared to select the recovered goods.
- **Company canteens – Afternoon.** In the afternoon, the collection of cooked unserved food, packaged or bulk fruit and bread surplus from company canteens, is directly delivered to people in need through the non-profit organization connected with the Hub.

2. **Circular economy concept for food: a city government self-assessment tool developed by the Ellen Macarthur Foundation.**

This case mainly deals with the topic of circular economy and food systems. Therefore, the main focus lies in creating nature-positive foods, regenerative food production and reduction or recycling of packaging. Nature-positive foods mean foods that use ingredients that come from regenerative agriculture or are upcycled (e.g. cookies made from left-over flour from plant-based milk production, cocoa fruit pulp, and crop leftovers). In order to create enabling conditions for boosting the circular economy in urban food systems, the Foundation has launched a tool allowing cities to self-assess their capacity to intervene in this topic. The tool allows city officers to identify the local strengths and weaknesses in terms of the circular economy. It only takes 15 minutes to identify them. Thus, it is not particularly problematic in terms of time, but some problems might rise for officers or municipalities after the assessment, as it leaves them with the responsibility of deciding whether, and eventually how, to develop actions that can contribute to overcoming the weaknesses that the tool has identified.

3. **Milano Food Policy**

A Food Policy is a set of policies that outline a shared vision of the future relationship of the city with food and define the key actions to implement this vision, harmonizing the various projects that the administration carries out on the subject of food.

In order to make its food system more equitable and sustainable Milan has decided to adopt its own Food Policy. The related strategy will guide city policies related to food from 2015 to 2020. In July 2014 the Municipality of Milan and the Cariplo Foundation signed an agreement for the definition and adoption of the Food Policy. The practice started with the mapping study of the food system and the development of a governance model that has Milan Municipality and Cariplo Foundation as coordinators. After the analysis of the strengths and weaknesses of the local food system, thanks to public consultation, the Food Policy was launched and, in that respect, 5 priorities were identified. One of the main peculiarities of the Milan Food Policy model lies in the fact that it looks at the different actors, which contribute with their everyday work to animate the local food system, as the real protagonists of the transformation of the local system towards sustainability. The municipality and Cariplo support them and coordinate their activities so that they all move together towards the common and shared priorities.

6.4. Results from WP5

Through a combination of the three rankings outlined in section 5.3, WP5 partners come to the following overview in Table 7. Almost all member states have at least 1 or more universities listed either on their merits in agricultural sciences and/or food science & technology or by the commitment to improve their environmental and social impact. Only Luxembourg and Malta are not represented in one of the three rankings, which could be attributed to the small populations of these two countries.

Furthermore, there are some differences in the number of universities of a specific country listed in the three rankings. For instance, Austria, Belgium, France, Germany, and Sweden are not well represented in the UI GreenMetric ranking. An explanation for this can be that UI GreenMetric

relies on self-assessment and, in these countries, there might be other rankings that have been preferred by these universities.

Table 7: Combined overview of the number of universities in the three different rankings

Member state	Shanghai Ranking AS & FST Universities	UI GreenMetrics	QS Sustainability Ranking
Austria	4	0	7
Belgium	5	0	8
Bulgaria	0	1	0
Croatia	1	1	1
Cyprus	0	0	1
Czech Republic	6	6	4
Denmark	3	1	5
Estonia	3	1	1
Finland	3	3	9
France	30	2	24
Germany	37	6	39
Greece	3	3	4
Hungary	0	11	3
Ireland	3	4	7
Italy	30	34	31
Latvia	0	3	2
Lithuania	0	1	1
Luxembourg	0	0	0
Malta	0	0	0
Netherlands	7	3	13
Poland	4	11	3
Portugal	10	7	6
Romania	0	11	2
Slovakia	2	3	0
Slovenia	1	1	2
Spain	33	29	25
Sweden	7	0	8
Total	**192**	**142**	**206**

Also, with the overview of Associated Countries in Table 8, we see some differences in the number of universities of a specific country listed in the three rankings. Many Turkish and Ukrainian universities participated in the self-assessment of the UI GreenMetric ranking. UI GreenMetric does pull in universities from countries that could be at a disadvantage with the QS and Shanghai Ranking. Norway and Switzerland, on the other hand, have fewer universities in the UI GreenMetric ranking, which already was discussed with the Member States overview;

UI GreenMetric relies on self-assessment and in these countries, there might be other rankings that have been preferred by these universities.

Table 8: Combined overview of number of universities in the three different rankings

Associated Countries	Shanghai Ranking AS & FST Universities	UI GreenMetrics	QS Sustainability Ranking
Albania	0	0	0
Armenia	0	2	0
Bosnia and Herzegovina	0	1	0
Faroe Islands	0	0	0
Georgia	0	0	0
Iceland	0	0	0
Israel	4	3	0
Kosovo	0	0	0
Moldava	0	0	0
Montenegro	0	0	0
Marocco	0	0	0
North Macedonia	0	1	0
Norway	4	0	4
Serbia	2	0	1
Switzerland	7	1	8
Tunisia	1	3	1
Turkey	4	83	0
United Kingdom	33	6	68
Ukraine	0	17	0
Total	**55**	**117**	**81**

In the next steps the identified universities in the Member States will be involved through the networks of EFFoST, ISEKI and FOODForce in the development of the branded network of EU university-driven local ecosystems to foster Food2030-inspired FS transitions (Task 5.3/Task 5.4).

7. Analysis of results of mapping studies

The results of the mapping studies outlined in the previous section allow for drawing some preliminary conclusions on current trends concerning activities promoting transitions towards sustainability of food systems in Europe. A key conclusion is that thinking and acting for reaching food systems sustainability is a widespread practice in Europe.

This conclusion is based on the analysis that cases in Europe tackle themes concerning food and sustainability through a wide range of angles:

- covering all parts of agro-food chains, from production to consumption, and even recycling;
- considering external factors like policy making, innovation approaches, partnerships, education and training, and funding strategies.

A second argument is that multiple stakeholders are jointly involved in mapped activities (farmers, private sector, public sector, academia, philanthropic organisations, etc.). These stakeholders are seen to work in multi-stakeholder partnerships, aiming at the joint and collaborative creation of new (economic, environmental and/or social) value, through an open process of interactions between the actors.

A third one is that cases show that activities in Europe do consider transitions in terms of sustainability, often through a combined consideration of its three dimensions, but also with high attention to the economic dimension.

Thinking and acting to reach food systems' sustainability is spread out in nearly all member states and concerns activities that take place at different scales, from public and/or private clusters, cities, regions and countries. Global initiatives have not yet been mapped, nor connected FS initiatives.

This said, the mapping studies also show that only some of the cases – usually the most recent ones – openly refer to the concepts of "food system" and to "food system approach". The results of the mapping studies do not allow concluding to what extent existing activities actually employ a food system approach, as defined in section 5.1- e.g. by identifying and addressing system loops or by considering and dealing with trade-offs among different outcomes. Further in-depth analysis of selected cases is needed to clarify this point.

Furthermore, the mapping studies also allow drawing some conclusions about the suitability of the methodology defined in Milestone 3.

The use of the template, based on the "Game" structure, is in particular shown to be applicable for studying cases in which different actors try to reach a common objective in a specific context. This seems to be particularly relevant for the Activity C Area in the SRIA of the Future Partnership SFS (P-SFS), namely the Area focusing on the Knowledge Hub of Food System Labs.

In the mapping of funders and their geographic spreading over Europe, the template is less useful. Here, other survey-based methods are more appropriate to use. These are relevant for Activity Area A in the SRIA of the P-SFS, namely about 'Funders strategies'.

Then, in the mapping of universities targeting individually specific sustainability goals, other methods based on sustainability indicators and categorization are preferred. This may best fit the Activity Area B 'Observatory' in the SRIA of the future P-SFS. However, if the mapping also includes university-driven campus initiatives, in which other actors are involved, the template remains the most appropriate tool.

Since the future partnership has multiple targets, a wider reflection on the kind of methodologies is recommended.

8. Recommendations for next tasks

This work on mapping studies provides recommendations for the future FOODPathS activities. These are categorized as follows:

(i) Recommendations for selecting cases to be studied in detail:

- It is proposed to select a limited number of cases for in-depth analysis, in particular their history and evolution. This allows revealing 'whether' and 'how' FS approaches become apparent (i.e. recognizing the logic in a series of actions with well-identified drivers, activities, outcomes and feedback loops).
- In order to select cases, the following considerations should be taken into account:
    - The SRIA's four R&I and Activity Areas of the future P-SFS should be covered;
    - The methods as here presented are proposed to focus on - in particular the used Template and herein the part on interactions between actors that jointly form a 'partnership'.
- In addition, a list of criteria needs to be developed and discussed with the WPs and task leaders involved. This allows for prioritizing a selected number of cases. Such a list of criteria preferably covers (a) different geographic contexts, stakeholder groups, activities, boundary conditions, and (b) enabling factors as well as the 3 dimensions of sustainability.

(ii) Recommendations targeting different stakeholder groups:

- For funder-oriented tasks (WP3), it is suggested to utilize lessons learned from cases in the prioritization of future calls for project funding;
- For the private sector-oriented tasks (WP4), it is suggested to study cases with the other stakeholder groups, in particular the public-oriented ones of WP7, and investigate the co-benefits and trade-offs;
- For academia-oriented tasks (WP5), it is recommended to study and learn from interactions between academia and other stakeholder groups in the local eco-systems (e.g. their campus);
- For the public sector-oriented initiatives (WP7), it is recommended to learn from organizational or social innovations in private- and academic-driven initiatives.

(iii) Recommendations that may be directly relevant for the development of the Prototype Partnership SFS:

- The in-depth case studies should target key elements of the Prototype in a coherent and effective manner, hence its governance model, *modus operandi*, focus areas, and exemplary roles of interacting actors in sustainability trajectories. The presentations of cases should serve to motivate a wide range of actors, and resulting in a snowball effect.

- Since case studies are often targeting FS at a geographically limited scale, attention should be paid to how scaling-up initiatives. Then, the major questions are:
    - Is a described FS activity scalable and to what level are lessons learned applicable?
    - What are EU-wide FS approaches and what are context-specific approaches?
    - How can lessons learned from cases be translated into program topics that are relevant for all FS? Which topics are to be considered in a particular FS, region, or local context?
- To build a sound basis for the future Partnership, it is strongly recommended to deepen our knowledge of key trends and concepts related to FS. Examples are: the diversity of governance models and their functioning; the functioning of networks of actors; the creation of value in partnerships at different scales (for whom and by whom) beyond economic value; the relevance and applicability of specific sustainability indicators; and how to consider and deal with trade-offs between different outcomes in food systems.

9. Timeline

The timeline provides insights in past activities and events related to the work on mapping results.

Date	Activities	Events
June 2022	Presenting and discussing the template	Workshop at Kick-off meeting of FOODPathS (physical event)
July 2022 – February 2023	Mapping FS in WP3 (targeting funders), WP4 (addressing primarily private sector-oriented co-creation cases), WP5 (focusing on universities with sustainability strategies), and WP7 (addressing primarily public sector-oriented cases)	Both physical and on-line events took place (like funders forums, Living Lab workshops, research and education events). Also, presentations have been given at 10+ EU events (these are registered by WP8 Communication & Dissemination).
February 2023	Preparing the reporting of mapping results	Several internal WP meetings and one EXCOM meeting agenda item.
March 2023	Presenting exemplary cases and discussing mapping results	Workshop on Mapping results (online event, 20/3/2023)
March-April 2023	Finalizing the Report on mapping results as Deliverable D2.1	

The future mapping studies are following the tasks in the Description of Activities (DoA) of FOODPathS, in particular within the tasks of WP3, 4, 5 and 7.

10. Key Performance Indicators (KPIs)

The following table presents the results of work related to this Deliverable 2.1 (N.A. = not applicable for this Deliverable 2.1). This is done per KPI category, as defined in the Description of Activities (DoA) of FOODPathS. The stated targets in the DoA are defined for the end of the FOODPathS project, hence for Month 42.

No.	KPI category	Main KPIs with obtained results	Target*
Out-come #1	Aligned governance & Commitment	(i)level of political & financial commitment to EU, national & local actions: **N.A.** (ii) percentage of committed EU countries and funding agencies: **15 out of 26 MS = 58%** (iii)inclusiveness via number of other co-funders (private, regional,..): **18**	*75%* *75%,* 20+
Out-come #2	Shared visions and actions	(i) level of partner's commitment to common mission, vision, strategy: **N.A.** (ii) perceived inclusiveness of the governance model by actors: **N.A.** (iii) percentage of coherently presented best practices: **There are over 60 cases presented (see annex), all using the same template; for universities, over 140 in Europe are listed in 'sustainability rankings'.**	100% 100% 100%
Out-come #3	Mutual Benefits by strengthening local FS actions	(i) number of culturally-specific priorities included in funders strategy: **N.A. (this will be done in next project phase)** (ii) number of functional FS Labs demonstrated by FOODPathS: **5 are explicitly named Living Lab and 10+ are indicated (innovation) Platform** (iii) percentage of exemplary cases with trade-offs: **This will be elaborated in the in-depth case studies in WP4 and in follow-up tasks in WP7**	15 10, <25%,

It should be noted that for Communication, Dissemination and Exploitation, WP-specific material indicators have been defined, like 'funder info packs', 'interactive maps', etc. These will be reported in WP8 deliverables.

Finally, as stated in the Description of Activities (DoA), this project can only provide information for categorised sets of **KPIs with indicative Targets** (a percentage level or fixed number) which are all evolving from 0 at the start of the project[3]. At the end of the 'Mapping' Phase 1, the EXCOM will set reference lines for targets that will be relevant for the construction of the future Partnership SFS.

[3] In a R&I project, KPI can be set for e.g. reduction of waste thanks to the actions carried out in a project. In this CSA, preparing a prototype Partnership, KPI are harder to define since there is no reference line at its start.

11. References

Allen, T., & Prosperi, P. (2016). Modeling Sustainable Food Systems. *Environmental Management*, *57*(5), 956-975. https://doi.org/10.1007/s00267-016-0664-8

De Vries, H., Donner, M. & Axelos, M. (2022). Sustainable food systems science based on physics principles. *Trends in Food Science and Technology*, Elsevier, 2022, 123, pp.382-392. ⟨10.1016/j.tifs.2022.03.027⟩

Ericksen, P. J. (2008). Conceptualizing food systems for global environmental change research. *Global Environmental Change*, *18*(1), 234-245. https://doi.org/10.1016/j.gloenvcha.2007.09.002

European Commission. Joint Research Centre (2022). *Concepts for a sustainable EU food system : Reflections from a participatory process*. Publications Office. https://data.europa.eu/doi/10.2760/381319

Galvagno, M., & Dalli, D. (2014). Theory of value co-creation : A systematic literature review. *Managing Service Quality*, *24*(6), 643-683. https://doi.org/10.1108/MSQ-09-2013-0187

Halberg, N., & Westhoek, H. (2019). *The added value of a food systems approach in research and innovation : SCAR SWG Food systems Policy Brief*. Publications Office of the European Commission Directorate General for Research and Innovation. https://data.europa.eu/doi/10.2777/407145

HLPE. (2017). *Nutrition and food systems* [A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security].

Ind, N., & Coates, N. (2013). The meanings of co-creation. *European Business Review*, *25*(1), 86-95. https://doi.org/10.1108/09555341311287754

Nguyen, H. (2018). *Sustainable food systems : Concept and framework*. FAO brief. https://www.fao.org/3/ca2079en/CA2079EN.pdf

SAPEA (2020). Science Advice for policy by European Academies (SAPEA): A sustainable food system for the European union. Berlin, Germany: SAPEA. DOI 10.26356/sustainablefood

van Berkum, S., Dengerink, J., & Ruben, R. (2018). *The food systems approach : Sustainable solutions for a sufficient supply of healthy food* [Memorandum 2018-064]. Wageningen Economic Research. https://doi.org/10.18174/451505

Vervoort, K., Trousse, B., Desole, M., Bamidis, P., Konstantinidis, E., Santonen, T., Petsani, D., Servais, D., De Boer, D., & Spagnoli, F. (2022). Harmonizing the evaluation of living labs : A standardized evaluation framework. *Proceedings of the XXXIII ISPIM Innovation Conference*.

Voorberg, W. H., Bekkers, V. J. J. M., & Tummers, L. G. (2015). A Systematic Review of Co-Creation and Co-Production : Embarking on the social innovation journey. *Public Management Review*, *17*(9), 1333-1357. https://doi.org/10.1080/14719037.2014.930505

Funded by
the European Union

12. Attachments (in separate file)

Funded by
the European Union

foodpaths

Funded by
the European Union