FOODSHIFT 2030

DELIVERABLE D3.2

VALIDATED CORE SET OF FOODSHIFT INDICATORS

Due date of deliverable 30/06/2021
Actual submission date 10/05/2022
Start date of project 01/01/2020
Duration 48 Months

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 862716.

Project Title	FoodSHIFT2030 - Food System Hubs Innovating towards Fast Transition by 2030
Contract Number	862716
Work Package	WP3 Assessing the benefits
Deliverable	D3.2 Validated core set of FoodSHIFT Indicators [M22]
Task(s)	Task 3.1 Identify and classify indicators for assessing benefits of food system innovations [M01-M17]
Document Name	Validated core set of FoodSHIFT Indicators
Due Date	M18: 30 June 2021 (extended)
Submission Date	M29: 10 May 2022
Dissemination Level	[X] P - Public [ ] CO – Confidential
Deliverable Lead	DRAXIS ENVIRONMENTAL SA (DRAXIS)
Author(s)	Aida Chaido Anthouli (DRAXIS) Christina Tsouti (DRAXIS) Katerina Valta (DRAXIS)
Point of Contact	Aida Chaido Anthouli, aanthouli@draxis.gr
Reviewers	Luke Schafer , University of Copenhagen
Keywords	Indicators, SDGs, economic, environmental and societal benefits, Food sovereignty, Food and nutrition security
Statement of originality	This deliverable contains original unpublished work except where clearly indicated otherwise.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 a core set of indicators. Through measuring these indicators, the FALs (located in Athens, Avignon, Barcelona, Bari, Berlin, Brasov, Copenhagen, Ostend, and Wroclaw) will be able to assess the current state of their food system and the benefits of their food system innovations. The indicators selected and created, as part of this Deliverable (D3.2), will be later used in particular in the coming Task T3.4.

Role in D3.2	Role in WP3	Partner	Participants	Contact details
Task Leader	Contributor	DRAXIS	Aida Chaido Anthouli Katerina Valta Christina Tsouti	aanthouli@draxis.gr katvalta@draxis.gr ctsouti@draxis.gr
Sub-task Leader	WP3 Leader	WUELS	Malgorzata Swaider Marta Sylla	malgorzata.swiader@upwr.edu.pl marta.sylla@upwr.edu.pl
Sub-task Leader	Contributor	ZALF	Jose Luis Vicente Beatrice Walthall	vicente@zalf.de beatrice.walthall@zalf.de
Sub-task Leader	Contributor	UMIL	Stefano Corsi	stefano.corsi@unimi.it
Sub-task Leader	Contributor	UCPH	Luke John Schafer	schafer@plen.ku.dk
Sub-task Leader	Contributor	ILVO	Maarten Crivits Carla Mingolla	maarten.crivits@ilvo.vlaanderen.be Carla.Mingolla@ilvo.vlaanderen.be

Table of Contents

Table of Contents 1
1. Executive Summary 8
2. Abbreviations 9
3. Introduction 11
Objective 11
Structure of the deliverable 12
4. Methodology 13
5. Understanding the general concept of indicators 20
What is an indicator? 20
What should be considered when developing a set of indicators? 21
6. Preparatory work for selecting FS indicators 23
The FoodSHIFT 2030 Project 23
Conceptualising the FoodSHIFT2030 indicators 24
7. Selecting FoodSHIFT2030 indicators 27
Athens FAL 28
7.1.1. FAL DNA overview 28
7.1.2. Proposed indicators 29
Avignon FAL 31
7.1.3. FAL DNA overview 31
7.1.4. Proposed indicators 32
Barcelona FAL 34
7.1.5. FAL DNA overview 34
7.1.6. Proposed indicators 35
Bari FAL 37
7.1.7. FAL DNA overview 37
7.1.8. Proposed indicators 38
Berlin FAL 40
7.1.9. FAL DNA overview 40
7.1.10. Proposed indicators 41
Brasov FAL 43
7.1.11. FAL DNA overview 43
7.1.12. Proposed indicators 44
Copenhagen FAL 46
7.1.13. FAL DNA overview 46
7.1.14. Proposed indicators 47

Ostend FAL 49
7.1.15. FAL DNA overview 49
7.1.16. Proposed indicators 50
Wroclaw FAL 52
7.1.17. FAL DNA overview 52
7.1.18. Proposed indicators 53
8. Conclusions 54
9. References 56
10. ANNEXES 59
ANNEX I: Relevant indicator frameworks 59
ANNEX II: Creation of an indicators' inventory 68
ANNEX III: Understanding the FAL DNA 72
First level understanding 72
Second level understanding 91
ANNEX IV: Research tools 93
FAL Questionnaire 93
Workshop exercise for understanding the relevant framework of FS2030 for the development of suitable indicators 95

List of Figures

Figure 1: Example of visualisation of the FAL DNA – Avignon FAL 15
Figure 2. Overview of the three food system components as adopted by the HLPE 25
Figure 3. Overview of the six major impact areas as adopted by the CRFS indicator framework 26
Figure 4. Target groups of the Athens FAL 73
Figure 5. Target groups of the Avignon FAL 74
Figure 6. Target groups of the Barcelona FAL 74
Figure 7. Target groups of the Berlin FAL 75
Figure 8. Target groups of the Bari FAL 76
Figure 9. Target groups of the Brasov FAL 77
Figure 10. Target groups of the Copenhagen FAL 77
Figure 11. Target groups of the Ostend FAL 78
Figure 12. Target groups of the Wroclaw FAL 78
Figure 13. Overview of the target groups addressed by the 9 FALs 79
Figure 14. Distribution of the challenges addressed by the FALs actions for each FAL 80
Figure 15. Relevance of FAL actions with the proposed solutions 83
Figure 16: Schematic representation of the framework of FS2030 LABs activities 92

List of Tables

Table 4-1: Example of selecting indicators relevant to the the CRFS framework 17
Table 4-2:Example of selecting and proposing further indicators to "capture" the overall FAL character and goals 18
Table 6-1. Innovation focus and SDGs correspondence for each FAL 24

Table 7-1: Athens FAL DNA 28
Table 7-2: List of selected indicators for Athens FAL 29
Table 7-3: Relevance of Athens selected indicators to the impact areas of FS2030 30
Table 7-4: Avignon FAL DNA 31
Table 7-5: List of selected indicators for Avignon FAL 32
Table 7-6: Relevance of Avignon selected indicators to the impact areas of FS2030 33
Table 7-7: Barcelona FAL DNA 34
Table 7-8: List of selected indicators for Barcelona FAL 35
Table 7-9: Relevance of Barcelona selected indicators to the impact areas of FS2030 36
Table 7-10: Bari FAL DNA 37
Table 7-11: List of selected indicators for Bari FAL 38
Table 7-12: Relevance of Bari selected indicators to the impact areas of FS2030 39
Table 7-13: Berlin FAL DNA 40
Table 7-14: List of selected indciators for Berlin FAL 41
Table 7-15: Relevance of Berlin selected indicators to the impact areas of FS2030 42
Table 7-16: Brasov FAL DNA 43
Table 7-17: List of selected indciators for Brasov FAL 44
Table 7-18: Relevance of Brasov selected indicators to the impact areas of FS2030 45
Table 7-19: Copenhagen FAL DNA 46
Table 7-20: Ostend FAL DNA 49
Table 7-21: List of selected indciators for Ostend FAL 50
Table 7-22: Relevance of Ostend selected indicators to the impact areas of FS2030 51
Table 7-23: Woclaw FAL DNA 52
Table 7-24: List of selected indciators for Wroclaw FAL 53
Table 7-25: Relevance of Wroclaw selected indicators to the impact areas of FS2030 53
Table 10-1. Summary of the main characteristics of indicator frameworks relevant to the FS2030 project 67
Table 10-2. Overview of the reviewed sources 69
Table 10-3. Summary of source and number of indicators recorded in the Task 3.1 inventory 71
Table 10-4. Mission of each of the 9 FALs 73
Table 10-5. The general objectives of the Athens FAL 81
Table 10-6. The general objectives of the Avignon FAL 81
Table 10-7. The general objectives of the Barcelona FAL 81
Table 10-8. The general objectives of the Berlin FAL 81
Table 10-9. The general objectives of the Bari FAL 81
Table 10-10. The general objectives of the Brasov FAL 82
Table 10-11. The general objectives of the Copenhagen FAL 82
Table 10-12. The general objectives of the Ostend FAL 82
Table 10-13. The general objectives of the Wroclaw FAL 82
Table 10-14. Means of the Athens FAL to contribute in the proposed solutions 84
Table 10-15. Means of the Avignon FAL to contribute in the proposed solutions 84
Table 10-16. Means of the Barcelona FAL to contribute in the proposed solutions 85
Table 10-17. Means of the Berlin FAL to contribute in the proposed solutions 85
Table 10-18. Means of the Bari FAL to contribute in the proposed solutions 85
Table 10-19. Means of the Brasov FAL to contribute in the proposed solutions 86
Table 10-20. Means of the Copenhagen FAL to contribute in the proposed solutions 86
Table 10-21. Means of the Ostend FAL to contribute in the proposed solutions 86
Table 10-22. Means of the Wroclaw FAL to contribute in the proposed solutions 87
Table 10-23. Operational objectives of the Athens FAL 88
Table 10-24. Operational objectives of the Avignon FAL 88
Table 10-25. Operational objectives of the Barcelona FAL 88

Table 10-26. Operational objectives of the Berlin FAL 88
Table 10-27. Operational objectives of the Bari FAL 88
Table 10-28. Operational objectives of the Brasov FAL 88
Table 10-29. Operational objectives of the Copenhagen FAL 89
Table 10-30. Operational objectives of the Ostend FAL 89
Table 10-31. Operational objectives of the Wroclaw FAL 90

1. Executive Summary

The development of a core set of indicators is one of the main outcomes of the FoodSHIFT2030 project. Through measuring these indicators, the FoodSHIFT2030 Accelerator Labs (FALs), located in Athens, Avignon, Barcelona, Bari, Berlin, Brasov, Copenhagen, Ostend, and Wroclaw, will be able *to assess the current state of their food system and the benefits of their food system innovations*.

The methodology used for selecting the indicators included first of all a preparatory work for selecting the FoodSHIFT2030 indicators. In order to come up with a set of meaningful, and relevant indicators, it was necessary to define first the goal of the indicators, and then establish the conceptual framework that the indicators operate. For that reason, a thorough literature review on the concepts of indicators, food systems, food and nutrition security and food sovereignty, and the study of relevant frameworks was made.

Also, it was fundamental for selecting the appropriate indicators to understand the FALs "DNA", and their identified challenges. This was possible through a number of interactions with the FALs representatives and the Subtask leaders, through one to one interviews, workshops and several meeting discussions.

All the above led in understanding in depth, the overall framework of the FoodSHIFT2030 project, and investigate into the food system components and the impact areas of our project. In particular, the following impact areas were examined:

- Environmental Sustainability
- Social sustainability and equity
- Economic sustainability
- Urban-rural integration
- Vulnerability and resilience
- Food govevernance

Taking into consideration all the above, the selection of the indicators was made, which includes 9 dedicated lists with 10-40 final indicators for each of the FALs. Preliminary selection was made by DRAXIS, with the support of the Subtask leaders. Later on, in order to finally select a set of meaningful and relevant indicators that the FALs could measure, validation was made through one-to-one interaction with the FALs themselves, which were the most appropriate as they were the best familiar of their capacities, challenges, and boundaries.

What was concluded is that the FoodSHIFT2030 indicators, if used well, will be a tool that can be quite beneficial for the project as a whole, the FALs, and each of the partners and entities involved. Various profits can derive, that can help the FALs, and all the project's partners, to measure whether their outcome and objectives have been achieved, and possibly get guided on future applications, improving, and fine-tuning forthcoming actions.

The work of indicators does not stop here. The whole process is quite dynamic and will be only finalised, by the end of the project and the full assessment of the project's results. The list of indicators provided for each of the FALs are only the start, providing a solid base for the future steps.

Finally, the indicators selected in this deliverable D3.2 will be tested, regarding their applicability, during some other tasks of this project as well. Namely, T3.4, T3.5, T6.1, T6.2, T6.3, and T6.4.

2. Abbreviations

ATH	Greater Athens FAL
AVG	Avignon FAL
BBI	Bio-based Industries
BCFN	Barilla Center for Food & Nutrition
BCN	Barcelona FAL
BER	Berlin FAL
BRI	Bari FAL
BRV	Brasov FAL
CFS	Committee on World Food Security
CPH	Greater Copenhagen FAL
CRFS	City Region Food System
Defra UK	Department for Environment, Food and Rural Affairs in the UK
DoA	Description of the Action
DPSIR	Drivers Pressures State Impact Responses
EC	European Commission
EEA	European Environmental Agency
EIU	Economist Intelligence Unit
EU	European Union
FAL	FoodSHIFT2030 Accelerator Lab
FALs	FoodSHIFT2030 Accelerator Labs
FAO	Food and Agriculture Organization of the United Nations
FAO-FS	Food and Agriculture Organization – Food Security
FELs	FoodSHIFT Enabler Labs
FNS	Food and Nutrition Security
FoodSHIFT2030	Food System Hubs Innovating towards Fast Transition by 2030
FS2030	FoodSHIFT2030 project
FSI	Food Sustainability Index
GFSI	Global Food Security Index
GHG	Green House Gas
IPCC	Intergovernmental Panel on Climate Change
MUFPP	Milan Urban Food Policy Pact
NGO	Non-Governmental Organizations
OECD	Organization for Economic Co-operation and Development
OST	Ostend FAL
PSR	Pressures State Responses
RACER	Relevance, Acceptability, Clarity, Easiness, Robustness
RUAF	Resource Centre on Urban Agriculture & Food Security
SAFA	Sustainability Assessment of Food and Agriculture systems
SCAR	Standing Committee on Agricultural Research
SDGs	Sustainable Development Goals
SMEs	Small and Medium-sized Enterprises
SUSFANS	SUStainable Food And Nutrition Security
UN	United Nations

UNFCCC	United Nations Framework Convention on Climate Change
WFP	World Food Programme
WRO	Wroclaw FAL

3. Introduction

Food is not only a fundamental need, but also a right for every human being. To this point, the Scientific Advice Mechanism[1] of the European Commission (EC) has identified five main challenges posed to the food systems:

i. Expanding global population, in combination with increased urbanisation to reach 70% in 2050, migration, and rural ageing;
ii. Climate change effects resulting in lower yields and harvest losses, changes in abundance and distribution of harvested freshwater and marine species, and increases in incidences of pests and diseases;
iii. Socio-economic trends leading to unhealthy and unsustainable food consumption patterns. One the one hand there is the increase in the demand for livestock products, while on the other there is the calorie-dense, nutrient-poor and (hyper-)processed food, resulting in malnutrition and health problems. Furthermore, these patterns can result in unsustainable land and water use, increasing greenhouse gas emissions;
iv. Depletion of natural resources and exploitation beyond environmental limits, e.g. loss of biodiversity and ecosystem services, overexploitation of marine and freshwater fisheries, air and water pollution, deforestation, and competing demands on agricultural land;
v. Geo-political events and shocks.

In the light of the above, the FoodSHIFT2030 project focuses on increasing the technological and societal readiness levels of food system innovations in nine selected city-regions across Europe. It focuses on identifying, maturing and scaling-up citizen-led innovations in the local communities that respond to social and environmental challenges, using sustainable design and circular economy principles to help scale and grow initiatives to become economically viable and socially valuable.

Objective

The objective of this deliverable D3.2 is to develop a core set of indicators in order the FoodSHIFT2030 FALs, located in Athens, Avignon, Barcelona, Bari, Berlin, Brasov, Copenhagen, Ostend, and Wroclaw, *to assess the current state of their food system and the benefits of their food system innovations".*

Developing the above indicators, and later monitoring, and assessing them, is one of the main outcomes of the FoodSHIFT2030 project.

The selected indicators, will be quite beneficial for the project as a whole, the FALs, and each of the partners and entities involved. Various profits can derive, that can help FALs, and all the project's partners, to measure whether their outcome and objectives have been achieved, and possibly get guided on future applications, improving, and fine-tuning forthcoming actions. The indicators will produce and provide reliable and comprehensible information, which will be accessible as well, to all external interested and involved parties (ex. international organizations, companies, government agencies, citizens, etc.). In addition, the indicators are aiming to communicate results, and enable and/or facilitate

[1] SAM (2019). 'A scoping review of major works relevant to scientific advice towards an EU sustainable food system', The Scientific Advice Mechanism Unit of the European Commission, 26 p. web version

the implementation of similar actions and the exchange of experience gained through the FS2030 project.

The indicators selected and created, as part of this Deliverable (D3.2), are planned later to be used in, or influence and affect other project tasks, particular the coming T3.4 - Assess the benefits of food system innovations", T3.5 "Co-construct spatial model and scenarios for food system innovations towards 2030", but also the T6.1 "Co-construct Citizen Empowerment Scheme", T6.2 "Co-design FoodSHIFT Job Creation Platform", T6.3 "Co-develop FoodSHIFT Sustainability Scoring System", and T6.4 "Co-create FoodSHIFT Transition Toolkit".

Structure of the deliverable

Deliverable 3.2 is organised as follows:

In Chapter 1 titled "Executive summary", the key points of the report are summarised and presented. The purpose of the study is stated, major aspects are highlighted and results as well as conclusions drawn are presented.

In Chapter 2 titled "Abbreviations", the abbreviations used throughout the present report are included.

In Chapter 3 titled "Introduction" (the present chapter), the objective and the structure of the report are presented.

In Chapter 4 titled "Methodology", the overall methodology followed, for identifying and classifying the FoodSHIFT2030 indicators, is presented.

In Chapter 5 titled "Understanding the general concept of indicators", what is an indicator and what should be considered when developing a set of indicators are investigated.

In Chapter 6 titled "Preparatory work for selecting FS indicators", the FoodSHIFT2030 project is presented, as well as the procedure followed for conceptualising the named indicators is presented.

In Chapter 7 titled "Selecting FoodSHIFT2030 indicators", the DNA of each FAL is provided in a form of a table which includes all the important elements that characterise each FAL, as the FALs' mission, general objectives, means, and innovation focus. Also, a table with a list of the final proposed indicators for each FAL is presented.

In Chapter 8 titled "Conclusions", the conclusions are drawn. Finally, some issues to be considered for the next steps are raised.

References are provided in Chapter 9.

Annexes are provided at the end of the deliverable in Chapter 10.

- Annex I – Relevant indicator frameworks
- Annex II – Creation of an indicators inventory
- Annex III – Understanding the FALs DNA
- Annex IV – Research tools (FAL Questioner, Workshop exercise for the FS2030 indicator framework development)

4. Methodology

In this chapter, the methodology that was followed in order to develop the validated list of indicators for the FALs of the FoodSHIFT2030 project is presented.

Literature review

A thorough literature review on the concepts of indicators, food systems, food and nutrition security and food sovereignty was made. Literature review included the study of scientific papers and book chapters, national and international guidelines, project's deliverables, online tools, etc. Several key words were used, both alone and combined, to explore literature, such as: *indicators, monitoring frameworks, assessment frameworks, food systems, food system approach, impact areas, food sovereignty, food security,* etc. The purpose of the review was twofold; first, to gain comprehensive insight on indicators, and indicator frameworks, both generic and food system specific, and second, to better understand the food system approach. An inventory of indicators, and indicator frameworks, relevant to food systems was created, including more than a thousand indicators (ANEXX II), and 5 frameworks (ANEXX I).

In particular, for the process of selecting indicators for the FoodSHIF2030 project, several relevant existing indicators' frameworks were considered, and investigated. These frameworks include the SDGs (Sustainable Development Goals), CRFS (City Region Food System), SAFA (Sustainability Assessment of Food and Agriculture systems), MUFPP (Milan Urban Food Policy Pact), EC FOOD 2030, SUSFANS (SUStainable Food And Nutrition Security), FSI (Food Sustainability Index), GFSI (Global Food Security Index), DPSIR (Drivers Pressures State Impact Responses), theme & sub-themes, etc. (ANEXX I).

Out of this study, an inventory of 1000+ relevant indicators was created (ANEXX II).

Understanding FALs DNA

The challenges identified, with regard to food systems, in the context of the FoodSHIFT2030 project, are:

i. Malnutrition
ii. Climate change
iii. Urbanisation

As a consequence, the FoodSHIFT2030 project identified three core groups of solutions, which are:

i. Healthy food
ii. Reducing Green House Gases (GHG) emissions
iii. More localised food systems

First level (questionnaire/one-to-one)

Having in mind the above challenges and solutions, a short questionnaire was developed and distributed to the nine FALs, in order to outline their profile with regard to food systems focusing on the aim and context of Task 3.1.

The questionnaire consisted of six questions, which were prefilled with examples to help the FALs during its completion. The questionnaire, which is presented in detail in "ANNEX III – First level Understanding", and in "ANNEX IV - FAL Questionnaire", was distributed in the FAL core teams, and short one-to-one calls were conducted between Task 3.1 leaders (i.e. DRAXIS) and each of the nine FALs, to discuss and further explain the purpose and structure of the questionnaire. Following, it was requested that the FAL core team could spent some time on filling in the questionnaire in a collaborative and creative way, meaning that not a specific type and structure of answer was requested. The next step

was to review the answers provided in this questionnaire to first of all gain a deeper understanding of the unique characteristics of each FAL. The review of questionnaires highlighted useful information that were used as a trigger for further and more targeted desk research.

This approach was a great opportunity both for the FAL core teams, and for Task 3.1, to discuss on their mission and objectives, as the project was evolving. Given the unprecedented circumstances of Covid-19 as well as the progression of the FALs activities, since they are running organisations regardless the FoodSHIFT2030 project, some targets and priorities have changed.

These results served as a preliminary base for the development of the FoodSHIFT2030 indicators.

It should be noted that the definitions included in the questionnaire regarding "mission", "general objectives" and "operational objectives", are based on the "management theory", and are explained based on Richard et al.[2].

Second level (workshop)

Following the one-to-one interviews with the nine FALs of the FoodSHIFT2030 project and the data processing of the questionnaires, a Task 3.1 workshop was realised. The Task 3.1 workshop was carried out as part of a WP3 workshop and was open to the whole consortium of the project. The Task 3.1 workshop was dedicated in presenting the following:

i. the task's main goals & interconnections with othe tasks and WPs,
ii. the methodology for identifying and classifying indicators for assessing benefits of food system innovations,
iii. a selection of food system indicators' frameworks towards selecting the suitable FoodSHIFT2030 indicators.

In addition, a 30 minutes exercise was designed for the FALs' in order to request their input on food system components and impact areas based on their innovation focuses. The detailed structure and content of the exercise is provided in "ANNEX III - Second level understanding", and in "Workshop exercise for understanding the relevant framework of FS2030 for the development".

In the figure 1 below, there is an example of visualizing the DNA of a FS2030 FAL, namely the Avignon FAL DNA, which was created in order to facilitate the later indicator selection process for the named FAL.

[2] Richard L. Daft, Patricia G. Lane, Management, Ninth Edition, 2010, South-Western, Cengage Learning

		AVIGNON FAL
		FAL DNA
Lab Organisational Committee		Leader: Avignon (Commune d'Avignon) Host: Avignon Assistant: INRA (Institut National de la Recherce Agronomique)
FAL MISSION		"Regional Lunch for All" Public procurement as a driver for a more regional, sustainable and healthy food system
FAL GENERAL OBJECTIVES		Healthy diets Prevention and less food waste Recycling of biowaste Local food systems
FAL MEANS	Healthy food	Awareness on healthy diets Applying public procurement procedures to boost healthy diets Preparation of healthy meals Adapt the national nutritional regulation (quality, quantity)
	Reducing GHGs emissions	Awareness on food waste Apply solutions (composting units) for food waste treatment
	More localised food systems	Applying public procurement procedures to increase local products proportion Social innovation Awareness on local food production Choose "green" local suppliers
INNOVATION FOCUS		Increase our partnerships with local and "green" food suppliers
		Health and nutrition: quality meals by more plant-based diets, from local and organic food products
		Fight against food waste and development of recycling bio-waste
		How public food procurement can be a driver to envision a city food strategy

		FAL Target group (relevant from 1-5)
1	Students	4
2	Teachers	2
3	Citizens	2
4	NGOs	0
5	Local farmers/producers	5
6	Entrepreneurs	4
7	Regional/Local Policy officers/makers	0
8	Professional kitchens	5
9	Teachers trainers	0
10	Regional authorities	0
11	Community kitchens	0
12	Parents	3
13	Academia/ Education	0
14	Innovation accelarators	0
15	Local institutions	0
16	Local food initiatives	0
17	Associations dealing with urban gardening	0
18	Social inclusion associations	0
19	Distribution	0

Figure 4.1: Example of visualisation of the FAL DNA – Avignon FAL

Selection of indicators

Preliminary selection

The above knowledge, from the literature review, and the understanding of the operational framework/ DNA of the FALs, was a base for the preliminary selection of indicators made by DRAXIS. Between 11-40 indicators were selected for each FAL, and served as a base for discussion for the next steps.

Having in mind to make use of the existing studied work of already tested indicators frameworks, the selected indicators were inspired in particular from the CRFS framework, that best suits the character of the FS2030. Of course all the other studied frameworks were considered when choosing. Also, some additional indicators were created, aiming to fill in possible gaps in order to provide a holistic picture of all FALs activities, especially when the character of the FAL was kind of special, and unique in its concept.

Some indicators were used as they were, taken from the CRFS, and others were altered a bit in order to match the needs and special character of the FAL, and the FS2030 project scopes. During the

selection, and creation process, several criteria were taken into account for example the RACER[3] criteria, and guidelines from relevant trustful studies[4] .

Finally, the impact areas of the FS2030 (Environmental Sustainability, Social sustainability and equity, Economic sustainability, Urban-rural integration, Vulnerability and resilience, and Food governance) where considerably taken into account when selecting the above indicators.

The implementation of Task 3.1 was a very dynamic and interactive process. Throughout the progress of the task, several consultation meetings with the Work Package leaders, the Innovation manager, the sub-task leaders, and the FALs were conducted. Moreover, there was monitoring and communication with other tasks relevant to Task 3.1 in order to exchange knowledge, insights, information and opinions. Input from other WPs, and from the work of the other Subtask Leaders was provided to DRAXIS. This was done in order to assess the work of the other partners in relation to the current Deliverable, not to duplicate existing work, to communicate goals, and understand better the needs of the project in relation to the T3.1 objectives.

Finally, after the vivid interactions through discussions and exchange of opinions, the final tables with selected indicators were ready to be presented to the FALs for the final selection.

Validation with FALs

The character of each FAL is quite different both in size, scope, type, experience, means, and purpose, therefore, the parameters to consider where quite complicated and of a great number. Thus, a different, yet with the same objective, to assess the benefits of food system innovations in terms of sustainability and food and nutrition security, approach was needed for each of the different FALs.

A constructive participation of the FALs, in the procedure of selecting the indicators, was a precondition in order for the indicators to match FALs' true needs, and activities. It was also important in relation to their capacities, in matter of counting and monitoring the indicators at a later stage, as for example at T3.4. Therefore, the selected and proposed indicators by DRAXIS were provided to the FALs in order to discuss the proposed framework, and move on with the final selection. In this spirit, a number of one-to-one meetings took place with all the FALs, and the final lists with indicators were formulated as they are presented in "Chapter 7 - Selecting FoodSHIFT2030 indicators".

During the process, the FALs were provided with all the necessary background information they needed for selecting, and formulating the final version of indicators, as well as the liberty to propose further indicators, for achieving a holistic approach and satisfy their FALs objectives. Also, previous input from prior discussions and opinions of the other subtask leaders was also provided to the FALs.

Following, in tables 4-1, 4-2 there are examples of the indicators' selection procedures for one of the FALs. Namely, in table 4-1 the FAL is asked to select among some CRFS origin indicators, and in tables 4-1, the FAL is asked to suggest further indicators of its own origin, or from other existing sources, in order to "capture" the overall FAL character and goals.

[3] DEVCO (Directorate-General for International Cooperation and Development) (2016) 'Annex 7: Monitoring and indicators', in Integrating the environment and climate change into EU international cooperation and development: Towards sustainable development. Tools and Methods Series Guidelines 6. Brussels: DEVCO.
[4] Bogdanski, A., Giuntoli, J., Mubareka, S., Gomez San Juan, M., Robert, N. & Tani, A. 2021. Guidance Note on Monitoring the Sustainability of the Bioeconomy at a Country or Macro-regional Level. Environment and Natural Resources Management Working Papers – Bioeconomy, No. 90. Rome, FAO and EC-JRC. https://doi.org/10.4060/cb7437en

Table 4.1: Example of selecting indicators relevant to the CRFS framework

	SELECTION OF INDICATORS (WE NEED YOUR INPUT !!!)				
CRFS Indicator No	**CRFS Indicators relevant to the FAL - SELECTED by DRAXIS (15/02/22)**	**Meaningful for the FAL (Yes/No)?**	**Measurable (Yes/No)?**	**Including the indicator (Yes/no)?**	**Comments (……)**
	Please look into the following indicators selected from DRAXIS from the CRFS framework, and do the following: *- Select the ones that you believe are more relevant to the FAL, and can be measurable in your opinion* *- You can alter the wording of the below selected CRFS indicators to meet the character of the specific FAL (if needed)* *We suggest that the indicators will be measured in two scales (Prototype scale / FAL final scale-results)*	*PLEASE SELECT [YES OR NO]*	*PLEASE SELECT [YES OR NO]*	*PLEASE SELECT [YES OR NO]*	*PLEASE COMMENT IF YOU WISH*
10	[Change in] citizens preference/willingness to pay for city region/local food products	[YES / NO]	[YES / NO]	[YES / NO]	
26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	[YES / NO]	[YES / NO]	[YES / NO]	
29	[Increase in] Annual number and type of nutritious food promotion initiatives (e.g.aimed at companies or the public)	[YES / NO]	[YES / NO]	[YES / NO]	
30	[Increase in] Presence of policies or regulations promoting healthier food ingredients/consumption	[YES / NO]	[YES / NO]	[YES / NO]	
34	[Increase in] Number of sustainable and local food public procurement policies and action plans that are being implemented	[YES / NO]	[YES / NO]	[YES / NO]	
35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	[YES / NO]	[YES / NO]	[YES / NO]	
39	[Increase in] Number of food education services that involve other food system actors (farmers, cooks, food vendors, policy makers) as educators	[YES / NO]	[YES / NO]	[YES / NO]	
46	[Increase in] Number of urban agriculture/community gardens within the city region; in low-income areas	[YES / NO]	[YES / NO]	[YES / NO]	
48	[Increase in] Numbers of *young people educated in quality food, nutrition and environmental protection through local food programmes	[YES / NO]	[YES / NO]	[YES / NO]	
63	[Increase in] Number of brands and labels developed for food from the city region (e.g. “local food”) ???	[YES / NO]	[YES / NO]	[YES / NO]	
66	[Increase in] Number/% of farms in the city region selling direct to consumers (e.g. CSA, box schemes)	[YES / NO]	[YES / NO]	[YES / NO]	
67	[Increase in] Number/% of farms in the city region trading direct at markets	[YES / NO]	[YES / NO]	[YES / NO]	
68	[Increase in] Number/% of farms in the city region selling direct to retailers or caterers	[YES / NO]	[YES / NO]	[YES / NO]	
76	[Increase in] Total value of annual sales of food produced in the city-region to customers based in the city region	[YES / NO]	[YES / NO]	[YES / NO]	
77	[Change in] Total consumer expenditure on “local food”	[YES / NO]	[YES / NO]	[YES / NO]	

79	[Increase in] Procurement of local/total food from local sources by public institutions (municipal agencies, publicly funded community organisations, schools, hospitals, health clinics. prisons, universities)	[YES / NO]	[YES / NO]	[YES / NO]		
85	[Increase in] Number of viable independent local food businesses and farms (farm profitability)	[YES / NO]	[YES / NO]	[YES / NO]		
88	[Increase in] Number of food businesses increasing the diversity of income streams (eg agri-tourism; product value addition; education; training etc)	[YES / NO]	[YES / NO]	[YES / NO]		
104	[Increase in] Number of food system workforce training opportunities in food safety	[YES / NO]	[YES / NO]	[YES / NO]		
105	[Increase in] Number of development support programmes for food businesses with a focus on improving i) performance (efficiency, profitability, marketing) and ii) sustainability, (reduced GHG emissions etc)	[YES / NO]	[YES / NO]	[YES / NO]		
108	[Increase in] Number of opportunities for i) food producers and ii) food businesses to gain ICT skills	[YES / NO]	[YES / NO]	[YES / NO]		
109	[Increase in] Proportion of (youth) producers who have adopted ICT in farming practices	[YES / NO]	[YES / NO]	[YES / NO]		
118	[Increase in] Types of market opportunities available to city region food producers (e.g. farmers markets, public sector food procurement, direct to consumers)	[YES / NO]	[YES / NO]	[YES / NO]		
119	[Increase in] Types and numbers of outlets where regional products are sold in the city	[YES / NO]	[YES / NO]	[YES / NO]		
120	[Increase in] Types and numbers of outlets where regional products are sold in the city	[YES / NO]	[YES / NO]	[YES / NO]		
124	[Increase in] Number of food procurement contracts which purchase products from the city region	[YES / NO]	[YES / NO]	[YES / NO]		
169	[Increase in] level of coherence of policies and plans that at national level ensure the linkages with the local food system policies	[YES / NO]	[YES / NO]	[YES / NO]		

Table 4.2:Example of selecting and proposing further indicators to "capture" the overall FAL character and goals

	Suggestion for other indicators - Other Sources (DRAXIS, 16/02/22) - (TO BE ELABORATED IF WISHED)	Meaningful for the FAL (Yes/No)?	Measurable (Yes/No)?	Include the indicator (Yes/no)?	Comment	Source - reference
1	[Increase in] Number of citizens that have been affected (informed/profited/participated) by the FALs operation	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
2	[Increase in] Number of citizens that have been informed on local food production	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
3	[Increase in] Number of citizens that have been informed on healthy diets	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework

	4	[Increase in] Number of citizens that have been informed on food waste issues	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
	5	[Increase in] Number of local producers that have been profited by the FALs operation	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
	6	Increase in] How much food waste has been saved (kg, %)	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
	7	[Decrease in] Meat consumption that has been substituted by more plant-based diets (kg, %)	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
	8	[Increase in] Number of policy makers and other relevant entities that have been informed	[YES / NO]	[YES / NO]	[YES / NO]		DRAXIS (relevant to FAL DNA and Innovation focus provided by the FAL) - No official framework
	12	*add more indicators if you wish….*	[YES / NO]	[YES / NO]	[YES / NO]		*add the source of your indicator…(ex. CRFS, paper, suggested by you - no formal framework, etc.)*
	13	*add more indicators if you wish….*	[YES / NO]	[YES / NO]	[YES / NO]		*add the source of your indicator…(ex. CRFS, paper, suggested by you - no formal framework, etc.)*
	14	*add more indicators if you wish….*	[YES / NO]	[YES / NO]	[YES / NO]		*add the source of your indicator…(ex. CRFS, paper, suggested by you - no formal framework, etc.)*
	15	*add more indicators if you wish….*	[YES / NO]	[YES / NO]	[YES / NO]		*add the source of your indicator…(ex. CRFS, paper, suggested by you - no formal framework, etc.)*

5. Understanding the general concept of indicators

What is an indicator?

Nowadays, the term indicator is a frequently used, but there is not still one concrete terminology used. There are occurring different application approaches, and concepts, as well as differentiation in understandings between policy and science. One of the most widely used definitions, of what is an indicator, is that of the Organization for Economic Co-operation and Development (OECD) which defines an indicator as *"A parameter, or a value derived from parameters, that points to, provides information about and/or describes the state of the environment, and has a significance extending beyond that directly associated with any given parametric value. The term may encompass indicators of environmental pressures, conditions and responses."*[5]

Several other definitions have been proposed throughout the years, as the following:

- "*An Indicator is a particular characteristic or reference marker used to measure whether an outcome is being achieved.*"[6]
- *"An indicator is an observed value representative of a phenomenon of study. In general, indicators quantify information by aggregating different and multiple data. The resulting information is therefore synthesised. In short, indicators simplify information that can help to reveal complex phenomena."* [7]
- *"Indicators are objective descriptions of a particular aspect of our natural, economic, or social environment."* [8]
- *"The purpose of an indicator is to summarize complex information into a simplified and useful manner and facilitate the identification of status and trends. …Indicators are used to convey information, quantify responses, and simplify information about complex ideas….To be useful, indicators must answer the questions being asked while being grounded within a conceptual framework that conveys not only what is being measured, but why and in what context. When tracked over time, an indicator can provide information on trends in the condition of a system."*[9]

The use of indicators should focus on the production and provision of reliable and comprehensible information, which will be accessible to all interested and involved parties (international organizations, companies, government agencies, citizens, etc.). In addition, the indicators should be able to enable and/or facilitate their implementation and the exchange of experience gained. Eventually, one will need indicators that are specific, measurable, achievable, relevant and time-bound.[7]

[5] OECD (1993), OECD Core Set of Indicators for Environmental Performance Reviews - A synthesis report by the Group on the State of the Environment, Environment Monographs N° 83, Paris

[6] EPA. 1994. Measuring Progress of Estuary Programs: A Manual. U.S. Environmental Protection Agency, Office of Water (4504F). EPA 842-B-94-008. November 1994.

[7] EEA[a] (2003), Environmental Indicators: Typology and Use in Reporting, European Environment agency, Copenhagen, Denmark

[8] The Heinz Center. 2003. The Coastal Zone Management Act: Developing a Framework for Identifying Performance Indicators. The H. John Heinz III Center for Science, Economics and the Environment.

[9] EPA (2008), Indicator Development for Estuaries manual, U.S. Environmental Protection Agency, Office of Water

Indicators are considered of crucial importance for the measurement of sustainability in local contexts as well as for national and international policies, as they allow to communicate, discuss and take decisions on complex facts and trends, using relatively few data[10].

Selecting appropriate indicators can prove to be a challenge as it involves the simultaneous examination of various dimensions (ecological, economic, technical, socio-cultural and political). In addition, it requires simultaneous examination at different scales of analysis (spatial: domestic, urban, regional, national and global; temporal: short-term and long-term).

The main challenge when using indicators, for monitoring and evaluating the performance of a system – and/or its subsystems – is the existence of reliable primary quantitative data. The lack of sufficient, and reliable, primary information makes the assessment of a system extremely difficult, and possibly distorted. That's coming to add the aforementioned lack of a common method of calculating the indicators. As a result, it becomes difficult both to select a set of monitoring and evaluation indicators, and to implement them successfully.

Nevertheless, the use of indicators can have several advantages, some of which are given below[7]:

- They contain condensed and concise information.
- They can reflect actions of the past, present and future related to various issues.
- They allow the evaluation of changes in relation to the set goals and objectives.
- They can indicate improvements or failures over time, as they are a comparative scientific tool.

On the other hand, the disadvantages of using indicators include the following [7], [11]:

- The quality of the data used to identify the indicators is often questionable because there are no standard data collection procedures.
- When determining indicators, it is not always easy to process and understand simple and direct connections between different data sources, due to time constraints, human and financial resources.
- The number of indicators is still too large to be able to fulfil the information and communication functions, so more effort must be made to integrate them.

What should be considered when developing a set of indicators?

As mentioned above selecting appropriate indicators can prove to be a challenge. So, in order to come up with a set of indicators for a specific purpose, one should first consider the **definition of the goal of indicators** (or a set of indicators), then the **establishment of the conceptual framework** that the indicators operate to finally **come up with a set of meaningful and relevant indicators**.

For each of the above activities as set of questions should be considered. Specifically:

For **defining the goal**:

- Why do we need the indicator?

[10] Coastal Wiki, http://www.coastalwiki.org/wiki/Sustainability_indicators

[11] Walz, R. (2000), Development of environmental indicator systems: Experiences from Germany, Environmental Management Vol. 25, No 6, pp. 613–623, Springer-Verlag NY

- Which is the intended audience?
- Which is the spatial and temporal scale that will be covered by the indicator?
- What methods will be applied during the indicators' development process?

For **establishing the conceptual model**:

- Which is the wider system in which the indicators operate and its characteristics (components, actors, drivers etc.)?
- Which is the specific context in which the indicators operate and their characteristics?
- Which are the impact areas?
- Which are the critical questions that the indicators will answer?
- Based on the above, which is the concept in which the indicators operate?
- Which are the existing relevant indicators' frameworks? Which is their applicability?
- Will the development of an indicators' inventory assist the process?

For **specifying the indicators**:

- How will the indicators be classified?
- Which criteria will be implemented to select indicators?
- Which are the validation needs and process?
- How will the indicators be documented (e.g. terminology, calculation method, metrics, etc.)?

Answering the abovementioned questions, is of high importance in order to understand the wider context, use, and appropriateness of the targeted indicators.

6. Preparatory work for selecting FS indicators

The FoodSHIFT 2030 Project

FoodSHIFT2030 aims to address gaps created by the current approaches to food system innovation in cities, which appear to be inadequate of sufficiently addressing the challenges of malnutrition and unhealthy diets, as well as the role of food system transition in mitigating climate change. The FoodSHIFT2030 project has set six objectives to be achieved. The project's objectives are listed bellow:

i. Accelerate the development of citizen-driven food system solutions through maturing, combining and upscaling sustainable food system innovations in European city-regions.
ii. Propagate the transition of the food system through establishing a mechanism for multiplying the acceleration of citizen-driven food system solutions.
iii. Support the empowerment of citizens in all European and global city-regions to influence the way their food is produced, distributed, consumed and recycled through co-constructing a citizen empowerment scheme.
iv. Facilitate job creation and business development in the European food sector through co-designing a job creation platform providing targeted information for different stakeholder groups, including SMEs, NGOs, municipalities and citizens.
v. Enable fast assessment of impacts of food system innovations on the Sustainable Development Goals by developing a simplified sustainability scoring system.
vi. Provide guidance for SMEs, NGOs, local governments and citizens on how to design a sustainable local food system, in which citizens are empowered to take active part in the food system transition.

For advancing the transition of the food system, FoodSHIFT2030 project will bring the sustainable food system approaches, and practices, into a citizen-driven "innovation accelerator" to mature, combine, and upscale them, and thereby increase their impact on the city-region food system. In order to trigger such radical innovation, the FoodSHIFT Accelerator Labs (FALs) are established, as citizen-drive open innovation living labs, featuring multidisciplinary collaboration between key food chain actors from private companies, local governments, research institutions, and the civil society. The large metropolitan city-regions that the FALs are located are Barcelona (BCN), Berlin (BER), Greater Athens (ATH), Greater Copenhagen (CPH), Wroclaw (WRO) and medium sized city-regions such as Avignon (AVG), Bari (BRI), Brasov (BRV) and Ostend (OST). The work of all the nine FALs focuses on both social and technological innovation, in order not only to provide food and nutrition security and contribute to job creation, but also to empower citizens and support the achievement of the Sustainable Development Goals (SDGs). Each of the FALs has defined an innovation focus, and innovation actions, to increase the technological and societal readiness levels of existing food system innovations, based on the innovation strengths of the participating frontrunner city regions. Furthermore, these innovation actions cover ten major themes, which in turn address eleven SDGs (1,2,3,4,8,9,11,12,13,15,17) across the FALs. In the following table the main focus of each of the nine FALs is presented.

FAL	FALs Missions	SDGs
ATH	**"Open School Lab"** Schools as sites of food experience and food system transformation	2,3,4,11,12,13,17
AVG	**"Regional Lunch for All"** Public procurement as a driver for a more regional, sustainable and healthy food system	2,3,4,9,11,12,17

BCN	**"Food Tech 3.0"** Solutions for local production in future cities - Understanding Fab Labs as sites to create, accelerate, link communities to, & build capacity in food tech.	2,3,8,9,11,17
BRI	**"Back to land"** Sustainable land use and food chain strategies for young entrepreneurs building on social innovation in food systems	1,2,3,4,8,9, 11,12,13,15, 17
BER	**"FoodLifeCentre"** An innovation hub for sustainable regional food supply based on a decentralisation concept for food distribution and education	2,3,4,8,9,11, 13,17
BRV	**"Interactive Food Lab"** Integrating traditional and local producers into an innovative and ambitious regional food system	2,3,9,11,13, 17
CPH	**"Kitchen of tomorrow"** Public procurement and professional kitchens for a sustainable regional food system, including rural and coastal areas	2,3,8,9,11, 12,13,17
OST	**"City Agro-Park"** Operationalisation of an agricultural park	1,2,3,4,9,11, 12,13,17
WRO	**"Accessible Food Gardens"** Strengthening of innovation potential of local sustainable food system.	2,3,4,9,11, 12,17

Table 6.1. Innovation focus and SDGs correspondence for each FAL

Overall project objective: *The ambition of FoodSHIFT2030 is to launch a citizen-driven transition of the European food system towards a low carbon circular future, including a shift to less meat and more plant-based diets.*

Conceptualising the FoodSHIFT2030 indicators

As mentioned earlier in subchapter 4.1.2, in order to come up with a set of indicators, one should first consider defining the goal of indicators, then establishing the conceptual framework that the indicators operate, in order to finally come up with a set of meaningful, and relevant, indicators.

Considering the above, in the context of the **FoodSHIFT2030** project, **the goal** for developing the indicators is to *assess the benefits of food system innovations in terms of sustainability and food and nutrition security*. The indicators are focusing primarily on *FAL level*, and *for the project duration.* The context of the nine FALs, it is quite wide and differentiated. They are all involved in a *variety of separate activities*. There is also *a variety of target audience*s for the FALs. Regarding FALs implementation scale, it significantly differs among the different FALs. Although the majority of the activities focus on the FAL scale, the scale of the organisations responsible for the operation of the FALs differs considerably, varying from the level of a private school, to the level of a municipal authority. This has an effect on the food system components each FAL affects. Regarding the methods, desk research as well as interviews, workshops, meetings, and questionnaires were applied for identifying the indicators.

For **establishing the conceptual model,** in the context of the FoodSHIFT2030 project, *food system* is considered the *wider system* and its basic components *are food supply chain, environments, and consumer behavior*. These components were proposed by the High Level Panel of Experts on Food

Security and Nutrition of the Committee on World Food Security[12] and were also adopted by the Task 3.1 of the FoodSHIFT2030. *"Food supply chain",* as wells as *"food environments",* consist of other sub-components, while *"consumers' behaviour"* is not further divided. The core context of each food system component is presented in Figure 6.1.

Figure 6.1. Overview of the three food system components as adopted by the HLPE

According to the HLPE[12], the *"food supply chain"* can be divided into five steps, i.e., production; storage; and distribution; processing and packaging; retail and markets, and can involve many large- to small-scale actors, both public and private. However, it was considered appropriate to include one more step in this food system component, this of *food waste management*. In more detail:

- *Production systems*: Farmers, indigenous peoples, agribusiness, land and plantation owners, fisheries, financial entities
- *Storage & distribution*: Transporters, agribusiness, distributors
- *Processing & packaging*: Packing plants, food and beverage industry, small and medium enterprises
- *Retail & markets*: Retailers, vendors, food outlet owners, traders, restaurateurs, wholesalers, formal & informal markets
- *Waste management*: Waste collection, Waste treatment & upcycling (e.g., composting, biodiesel production etc.).

Moving on to *"food environments"*, according to the same report, four elements are identified in this component, i.e., physical and economic access to food (proximity and affordability); food promotion, advertising and information; and food quality and safety[12]. In more detail:

- *Availability and physical access (proximity)*: Food availability refers to the adequate supply of food at the national or international levels. Physical access to food depends first on the built environment (presence of food entry points and adequate infrastructures to access them). Making nutritious foods more accessible and convenient in public places (schools, hospitals,

[12]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, Rome.

etc.), as well as in home and school gardens, and rural marketplaces to provide greater dietary diversity and quality.

- *Economic access (affordability)*: Economic access to food (food affordability) reflects the relative cost of food compared with a household's income and purchasing power. For consumers to be able to purchase and consume the foods that are available within the food environment, these also need to be affordable.
- *Promotion, advertising and information*: Includes activities related to food promotion through various means (including broadcast, print and digital advertising; packaging, labelling and point of sale promotions; branding and sponsorship; merchandising and the use of licensed or brand-based characters). Considering the FoodSHIFT2030 character, all activities related to education and awareness raising are falling under this category[12].

Food quality and safety: Food quality describes the attributes of a food that influence its value, and that makes it acceptable, or desirable, for the consumer. This includes: size, shape, colour, texture, flavour, food composition (ingredients and nutrients), as well as the way food is produced or processed (i.e. "organic", "cage free", "without antibiotics"). It also refers to the standards, and controls, that are in place to protect consumers from unsafe foods[12].

In addition, for **establishing the conceptual model** in the context of the FoodSHIFT2030 project, it is important to define the *impact areas*. Impact areas are perceived as broader areas of interest for the food system that the various innovation focuses of the FALs, could have an impact on. Six impact areas were chosen to be included in the FoodSHIFT2030 Task 3.1, which are according to the City Region Food System (CRFS)[13] framework which best suits the FoodSHIFT2030 project. The six impact areas are *social sustainability and equity; environmental sustainability, economic sustainability, urban-rural integration, food governance; vulnerability and resilience*. The core context of each impact area is presented in Figure 6.2.

Figure 6.2. Overview of the six major impact areas as adopted by the CRFS indicator framework

[13] Carey J., Dubbeling M. (2017), City Region Food SystemIndicator Framework – City Region Food System ToolkitAssessing and planning sustainable city region food systems, developed by FAO, RUAF Foundation and Wilfrid Laurier University.

According to the CRFS framework, the six impact areas can be briefly explained as follows[13]:

- *Social sustainability and equity*: Improve health and well-being and increase access to food and nutrition, improve social conditions for workers, build local food culture & heritage
- *Environmental sustainability*: Improve protection and management of ecosystems and environmental resources
- *Economic sustainability*: Increase local economic growth and generate a diversity of decent jobs and income.
- *Urban-rural integration:* Strengthen the city region food production and supply system
- *Food governance*: Improve horizontal & vertical governance and planning
- *Vulnerability and resilience*: Reduce vulnerability and increase resilience of food systems.

7. Selecting FoodSHIFT2030 indicators

This chapter is dedicated in presenting the indicators for each of the FALs. The selection, was based on a series of parameters as is as already described in "Chapter 4 - Methodology" above. The indicators selected for the FoodSHIFT FALs are meaningful and measurable, and are principally aiming at assessing the current state of the food system and the benefits of food system innovations.

In particular, for each FAL two tables are provided. The first one summarises the FAL DNA, including all the work that is described in the previous chapters, and the second presents the list of selected indicators that is validated by the FALs.

In the following tables, the indicators, are coloured appropriately in relation to the six FoodSHIFT2030 impact areas they address. In particular:

Impact areas	
Social sustainability and equity	Improve health and well-being and increase access to food and nutrition, improve social conditions for workers, build local food culture & heritage
Economic Sustainability	Improve protection and management of ecosystems and environmental resources
Urban-rural integration	Increase local economic growth and generate a diversity of decent jobs and income
Environmental sustainability	Strengthen the city region food production and supply system
Food governance	Improve horizontal & vertical governance and planning
Vulnerability and resilience	Reduce vulnerability and increase resilience of food systems

Athens FAL

7.1.1. FAL DNA overview

In the table below the components that characterize Athens FAL/ FAL DNA are presented.

Table 7.1: Athens FAL DNA

ATHENS FAL					
FAL DNA					
Lab Organisational Committee		**Leader: Ellinogermaniki Agogi School (EA)** **Host: Dimos Pallinis (Pallini Municipality in Attica Region)** **Assistant: DRAXIS SA**			
FAL MISSION		**"Open School Lab" - Schools as sites of food experience and food system transformation**			
FAL GENERAL OBJECTIVES		**Healthy diets - less meat-based nutrition** **Less food waste** **Rural-urban gap, reconnection with earth, valuing of food**			
FAL MEANS	**Healthy food**	Raising awareness on healthy diets of students Student projects on healthy food/physical activity Monitoring of students' meals & level of physical activity Students' BMI measurement Preparation of healthy meals in school restaurant & canteen or other actual solutions Applying public procurement procedures to boost healthy diets			
	Reducing GHGs emissions	Raising awareness on food waste Apply solutions (composting units) for food waste treatment Applying public procurement procedures to reduce climate risk/ boost sustainability			
	More localised food systems	Raising awareness on local food production IT solutions and capacity building for local production Social innovation Applying public procurement procedures to increase local products proportion			
INNOVATION FOCUS		Community empowerment providing hands-on learning opportunities for the food-smart citizens of tomorrow			
		Cooperating solutions for using leftovers in school canteens and kitchens			
		Social innovation by engaging schools in (re-) connecting young people with land, nature and use summer courses to promote healthy eating and plant-based foods.			
Target group (relevant from 1-5)		Students	5	Community kitchens	0
		Teachers	5	Parents	4
		Citizens	0	Academia/ Education	0
		NGOs	0	Innovation accelarators	0
		Local farmers/producers	0	Local Institutions	0
		Entrepreneurs	0	Local food initiatives	0
		Regional/Local Policy officers/makers	0	Associations dealing with urban gardening	0
		Professional kitchens	5	Social inclusion associations	0
		Teachers trainers	5	Distribution	0
		Regional authorities	0		

7.1.2. **Proposed indicators**

In the following table a list of the final selected indicators for Athens is presented. The table is a result of applying the research methodology, and discussions with the Athens FAL.

Table 7.2: List of selected indicators for Athens FAL

		SELECTION OF INDICATORS	
No	**Source***	**Indicators relevant to Athens FAL**	**Comments**
1	*Relevant to CRFS No 35*	*[Increase in] Number of food system related educational activities in school*	
2	*Relevant to CRFS No 36*	*[Increase in] Number of students involved in food system related educational activities in school*	
3	*Relevant to CRFS No 36*	*[Increase in] Number of teachers involved in food educational activities in school*	
4	*Relevant to CRFS No 37*	*[Increase in] Number of educational programmes with a comprehensive food systems perspective that includes health in school education*	
5	*Relevant to CRFS No 38*	*[Increase in] Number of students participating in the educational activities above*	
6	*Relevant to CRFS No 37*	*[Increase in] Number of educational programmes with a comprehensive food systems perspective that includes health in teachers training*	
7	*Relevant to CRFS No 38*	*[Increase in] Number of teachers participating in the above training activities*	
8	*Relevant to CRFS No 37*	*[Increase in] Number of training programmes with a comprehensive food systems perspective that includes health in kitchen staff*	
9	*Relevant to CRFS No 39*	*[Increase in] Number of kitchen staff gaining the above training*	
10	*Relevant to CRFS No 39*	*[Increase in] Number of training services that involve other food system actors (farmers, cooks, food vendors, policy makers) as educators*	
11	*Relevant to CRFS No 40*	*[Increase in] Number of schools teaching healthy eating, nutrition and cookery*	
12	*Relevant to CRFS No 79*	*[Increase in] Procurement of local/total food from local sources by schools*	
13	*Relevant to CRFS No 79*	*[Increase in] Number of schools including procurement of local/total food from local sources*	
14	*Relevant to CRFS No 124*	*[Increase in] Number of food procurement contracts which purchase products from the city region*	
15	*Relevant to CRFS No 35*	*[Increase in] Number of hands-on urban-rural integration activities in school*	
16	*Relevant to CRFS No 36*	*[Increase in] Number of students involved in hands-on urban-rural integration activities in school*	
17	*Relevant to CRFS No 36*	*[Increase in] Number of teachers involved in practical urban-rural integration activities in school*	
18	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive urban-rural integration perspective that includes health in education*	
19	*Relevant to CRFS No 38*	*[Increase in] Number of students gaining the above education*	
20	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive urban-rural integration perspective in teachers training*	
21	*Relevant to CRFS No 38*	*[Increase in] Number of teachers gaining the above training*	
22	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive urban-rural integration perspective in kitchen staff*	
23	*Relevant to CRFS No 39*	*[Increase in] Number of kitchen staff gaining the above training*	
24	*Relevant to CRFS No 40*	*[Increase in] Number of schools teaching urban-rural integration theory*	
25	*Relevant to CRFS No 156*	*[Decrease in] Annual volume and proportion of total food waste produced by school kitchens*	
26	*Relevant to CRFS No 157*	*[Increase in] Annual volume of total urban safe and nutritious food recovered and redistributed for direct human consumption by school kitchens*	
27	*Relevant to CRFS No 158*	*[Increase in] Annual volume of food waste recycled in feed, compost, energy recovery, etc. – as context allows by school kitchens*	
28	*Relevant to CRFS No 35*	*[Increase in] Number of practical food waste prevention and treatment activities in school*	
29	*Relevant to CRFS No 36*	*[Increase in] Number of students involved in practical food waste prevention and treatment activities in school*	
30	*Relevant to CRFS No 36*	*[Increase in] Number of teachers involved in practical food waste prevention and treatment activities in school*	

31	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive food waste prevention and treatment perspective in higher education*	
32	*Relevant to CRFS No 38*	*[Increase in] Number of students gaining the above higher education*	
33	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive food waste prevention and treatment perspective in teachers training*	
34	*Relevant to CRFS No 38*	*[Increase in] Number of teachers gaining the above training*	
35	*Relevant to CRFS No 37*	*[Increase in] Number of education programmes with a comprehensive food waste prevention and treatment perspective in kitchen staff*	
36	*Relevant to CRFS No 39*	*[Increase in] Number of kitchen staff gaining the above training*	
37	*Relevant to CRFS No 40*	*[Increase in] Number of schools teaching healthy food waste prevention and treatment theory*	

* Sources for inspiration were CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.3: Relevance of Athens selected indicators to the impact areas of FS2030

Total indicators		37
Impact areas	Social sustainability and equity	11
	Economic Sustainability	2
	Urban-rural integration	11
	Environmental sustainability	13
	Food governance	0
	Vulnerability and resilience	0

Avignon FAL

7.1.3. FAL DNA overview

In the table below the components that characterize Avignon FAL/ FAL DNA are presented.

Table 7.4: Avignon FAL DNA

AVIGNON FAL					
FAL DNA					
Lab Organisational Committee		**Leader: Avignon (Commune d'Avignon)** **Host: Avignon** **Assistant: INRA (Institut National de la Recherce Agronomique)**			
FAL MISSION		**"Regional Lunch for All" - Public procurement as a driver for a more regional, sustainable and healthy food system**			
FAL GENERAL OBJECTIVES		**Healthy diets** **Prevention and less food waste** **Recycling of biowaste** **Local food systems**			
FAL MEANS	**Healthy food**	Awareness on healthy diets Applying public procurement procedures to boost healthy diets Preparation of healthy meals Adapt the national nutritional regulation (quality, quantity)			
	Reducing GHGs emissions	Awareness on food waste Apply solutions (composting units) for food waste treatment			
	More localised food systems	Applying public procurement procedures to increase local products proportion Social innovation Awareness on local food production Choose "green" local suppliers			
INNOVATION FOCUS		Increase our partnerships with local and "green" food suppliers			
		Health and nutrition: quality meals by more plant-based diets, from local and organic food products			
		Fight against food waste and development of recycling bio-waste			
		How public food procurement can be a driver to envision a city food strategy			
Target group (relevant from 1-5)		Students	4	Community kitchens	0
		Teachers	2	Parents	3
		Citizens	2	Academia/ Education	0
		NGOs	0	Innovation accelarators	0
		Local farmers/producers	5	Local Institutions	0
		Entrepreneurs	4	Local food initiatives	0
		Regional/Local Policy officers/makers	0	Associations dealing with urban gardening	0
		Professional kitchens	5	Social inclusion associations	0
		Teachers trainers	0	Distribution	0
		Regional authorities	0		

7.1.4. **Proposed indicators**

In the following table a list of the final selected indicators for Avignon is presented. The table is a result of applying the research methodology, and discussions with the Avignon FAL.

Table 7.5: List of selected indicators for Avignon FAL

SELECTION OF INDICATORS			
No	**Source***	**Indicators relevant to Avignon FAL**	**Comments**
		Innovation focus 1: Increase our partnerships with local and "green" food suppliers	
1	Avignon FAL	[Increase in] Financial volumes from these partnerships	
2	Avignon FAL	[Increase in] Number of partnerships	
3	Avignon FAL	[Change in] these partnerships'' typology (public contracts…)	
		Innovation focus 2: Health & nutrition: quality meals by more plant-based diets, from local & organic food products	
4	Avignon FAL - related to the French EGALIM Law	[Increase in] Public procurement of organic products	
5	Avignon FAL - related to the French EGALIM Law	[Increase in] Public procurement of "quality" products (i.e. with a quality label)	
6	Avignon FAL - related to the French EGALIM Law	One vegetarian meal proposed per week to all the users of our food catering service	
7	Avignon FAL	[Increase in] "homemade" cooked meals or food components	
8	Avignon FAL	An operative system to follow the meals enjoying, dedicated to the canteens staff	
9	CRFS No 34	[Increase in] Number of sustainable and local food public procurement policies and action plans that are being implemented	
10	CRFS No 79	[Increase in] Procurement of local/total food from local sources by public institutions (municipal agencies, publicly funded community organisations, schools, hospitals, health clinics. prisons, universities)	
11	CRFS No 124	[Increase in] Number of food procurement contracts which purchase products from the city region	
12	CRFS No 159	Presence of policy or strategy that appropriately addresses practical issues of i) food loss and waste prevention, ii) reduction and iii) recycling	
		Innovation focus 3: Fight against food waste and development of recycling bio-waste	
13	Avignon FAL	An operative system to follow the results of the biowaste weights	
14	Avignon FAL	[Decrease in] The weights' results in volumes	
15	Avignon FAL	An operative system to follow the meals enjoying, dedicated to the canteens staff to avoid food waste	
16	Avignon FAL	Number of times per year dedicated to increase awareness about food waste prevention, both for the children and the cooking and service staff	
		Innovation focus 4: How public food procurement can be a driver to envision a city food strategy	overarching focus & indicators were not really adapted

* Sources for inspiration were CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.6: Relevance of Avignon selected indicators to the impact areas of FS2030

Total indicators		16
Impact areas	Social sustainability and equity	3
	Economic Sustainability	3
	Urban-rural integration	1
	Environmental sustainability	5
	Food governance	4
	Vulnerability and resilience	0

Barcelona FAL

7.1.5.FAL DNA overview

In the table below the components that characterize Barcelona FAL/ FAL DNA are presented.

Table 7.7: Barcelona FAL DNA

BARCELONA FAL					
FAL DNA					
Lab Organisational Committee		**Leader: IAAC (INSTITUT D'ARQUITECTURA AVANCADA DE CATALUNYA)** **Host: IAAC** **Assistant: Nfood**			
FAL MISSION		**"Food Tech 3.0" - Solutions for local production in future cities - Understanding Fab Labs as sites to create, accelerate, link communities to, & build capacity in food tech.**			
FAL GENERAL OBJECTIVES		**Socializing the use of food tech* in urban food production, elaboration and recycling within circular communities of practice;** **Boost food tech prototypes through training, featured in 3 acceleration tracks–technology, business and community;** **Upscaling practices through the FELs - Fab City, Fab Lab networks.**			
FAL MEANS	**Healthy food**	Raising awareness on locally produced (i.e. in vertical and urban agriculture); Emphasizing on maximizing the use of nutrients through food upcycling; Collaboration with social initiatives that directly promote healthy meals.			
	Reducing GHGs emissions	Encouraging development urban agriculture to limit GHG; Encouraging development / implementation of local food upcycling to reduce GHG from elaborating & importing food products.			
	More localised food systems	Promoting technology that can facilitate local food production (i.e. garden sensors, vertical farming techniques, etc.); Promoting methodologies for implementing the above mentioned tech within communities of practice; Raising awareness on the capacity for local, urban food citizenship.			
INNOVATION FOCUS		Development & piloting of open-source food technology, & affiliated processes, that can facilitate the management, monitoring, socialization, & efficiency of food production, elaboration, consumption & recycling in cities.			
		Promote existing and new innovative initiatives in urban farming technologies in Barcelona with facilitation of the municipality and offer support and training.			
		Developing 'innovative food tech flagship initiatives' for wider application in city-regions and coastal communities.			
		Continued collaboration and upscaling these ideas within FAL's networks, as Fab City Barcelona initiatives.			
Target group (relevant from 1-5)		Students	5	Community kitchens	1
		Teachers	5	Parents	1
		Citizens	4	Academia/ Education	2
		NGOs	2	Innovation accelarators	5
		Local farmers/producers	1	Local Institutions	3
		Entrepreneurs	4	Local food initiatives	4
		Regional/Local Policy officers/ makers	3	Associations dealing with urban gardening	2
		Professional kitchens	1	Social inclusion associations	2
		Teachers trainers	5	Distribution	1
		Regional authorities	3		

*food tech that is community-based, citizen-powered and encourages food citizenship; addresses holistic sustainability; incorporates open design practices; operates in an ecosystem of actors; and prioritises equity and accessibility.

7.1.6. Proposed indicators

In the following table a list of the final selected indicators for Barcelona is presented. The table is a result of applying the research methodology, and discussions with the Barcelona FAL.

Table 7.8: List of selected indicators for Barcelona FAL

SELECTION OF INDICATORS			
No	**Source***	**Indicators relevant to Barcelona FAL**	**Comments**
1	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. "fab city hub" activities)	Prototype scale
2	CRFS No 34	[Increase in] Number of sustainable and local food public procurement policies and action plans that are being implemented	Maybe we can provide from data available (if) from the local government
3	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (e.g. food tech education)	Prototype scale - We can give numbers related to the Food Tech 3.0 programme
4	CRFS No 36	[Increase in] Number of city residents involved in community – based food activities (education, campaigns, food growing, processing or marketing, communication etc.)	We can give numbers related to the Food Tech 3.0 programme
5	CRFS No 47	[Increase in] Number of city residents involved with urban food citizenship practices with the FAL	Prototype scale - We can give numbers related to the Food Tech 3.0 programme
7	CRFS No 78	[Increase in] Number of jobs resulting from growth of the FAL through the project	FAL final scale-results - We can give numbers related to the Food Tech 3.0 programme
8	CRFS No 88	[Increase in] Number of food businesses increasing the diversity of income streams (eg. Distributed design, product value addition; education; training etc)	We can give numbers related to the Food Tech 3.0 programme
9	CRFS No 104	[Increase in] Number of food system workforce training opportunities	FAL final scale-results - We can give numbers related to the Food Tech 3.0 programme
10	CRFS No 105	[Increase in] Number of development support programmes for food businesses with a focus on improving i) performance (efficiency, profitability, marketing) and ii) sustainability, (reduced GHG emissions etc)	Maybe we can provide absolute numbers with a local partner (accelerator) maybe other government open date
11	CRFS No 164	[Improvements to] Presence of and investments in a food policy or strategy	Maybe we can provide absolute numbers with a local partner (accelerator) maybe other government open date
12	CRFS No 173	[Increase in] Diversity of citizen composition in multi-stakeholder groups	Maybe we can provide absolute numbers related to the Food Tech 3.0 programme
13	CRFS No 169	[Increase in] level of coherence of policies and plans that at national level ensure the linkages with the local food system policies	
14	CRFS No 183	[Improve in] Information available about financial and human resources dedicated to food programmes	Maybe we can provide from data available (if) from the local government

15	MUFPP [Societal Benefits/Community empowerment]	[Increase in] Presence of food-related policies and targets with a specific focus on socially vulnerable groups	Maybe we can provide a number for in the context of the FAL
16	SAFA [Societal Benefits/Community empowerment]	[Increase in] Effective participation of citizens/local stakeholders in decision making processes	Maybe we can provide a number for in the context of the FAL, note, effective (quality) is not about efficiency
17	MUFPP [Societal Benefits/Community empowerment]	[Increase in] Number of community-based food assets in the city.	Maybe we can provide a number for in the context of the FAL
18	MUFPP [Societal Benefits/Community empowerment]	[Increase in] Number of (types of) opportunities for food-related learning and skill development in food and nutrition literacy, employment training and leadership.	Maybe we can provide a number for in the context of the FAL
19	[Societal Benefits/Social cohesion]	[Increase in] number of and interaction in food networks	Maybe we can provide a number for in the context of the FAL
20	[Societal Benefits/Social cohesion]	[Increase in] number of (mostly informal) associations	Maybe we can provide a number for in the context of the FAL
21	[Societal Benefits/Social cohesion]	[Increase in] interaction between people with a different social/ethnic background in associations	Maybe we can provide a number for in the context of the FAL

* Sources for inspiration were CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.9: Relevance of Barcelona selected indicators to the impact areas of FS2030

Total indicators		21
Impact areas	Social sustainability and equity	12
	Economic Sustainability	4
	Urban-rural integration	0
	Environmental sustainability	0
	Food governance	4
	Vulnerability and resilience	0

Bari FAL

7.1.7. FAL DNA overview

In the table below the components that characterize Bari FAL/ FAL DNA are presented.

Table 7.10: Bari FAL DNA

BARI FAL					
FAL DNA					
Lab Organisational Committee		**Leader: Bari** **Host: Bari** **Assistant: UMIL + CIHEAM**			
FAL MISSION		**"Back to land" - Sustainable land use and food chain strategies for young entrepreneurs building on social innovation in food systems**			
FAL GENERAL OBJECTIVES		**Healthy diets - increase the youth interest in farming and the agrifood sector (employability)** **Less food waste promote the use of abandoned lands** **Rural-urban gap - favour a more localized and sustainable production**			
FAL MEANS	**Healthy food**	Awareness on healthy diets Applying public procurement procedures to boost healthy diets Preparation of healthy meals or other actual solutions			
	Reducing GHGs emissions	Awareness on food waste Apply solutions (composting units) for food waste treatment Applying public procurement procedures to reduce climate risk/ to boost sustainability			
	More localised food systems	Applying public procurement procedures to increase local products proportion Promote short food supply chains IT solutions and capacity building for local production Social innovation Awareness on local food production Favour new consumption habits linked to social and environmental sustainability			
INNOVATION FOCUS		Empowerment of existing food system innovators by the co-design of services and tools to encourage youth entrepreneurship and job creation			
		Favouring innovative, sustainable and shared practices for renewed local food system (linking production, processing, distribution, consumption, recycling and upcycling)			
		Supporting ethical and responsible reuse of abandoned lands (those confiscated from the Mafia as well) for a higher level of social and technological food system innovation			
		Supporting social innovation via education on the importance of moving to less meat-based diets			
Target group (relevant from 1-5)		Students	4	Community kitchens	0
		Teachers	0	Parents	0
		Citizens	5	Academia/ Education	0
		NGOs	0	Innovation accelarators	0
		Local farmers/producers	5	Local Institutions	5
		Entrepreneurs	5	Local food initiatives	5
		Regional/Local Policy officers/makers	5	Associations dealing with urban gardening	5
		Professional kitchens	5	Social inclusion associations	5
		Teachers trainers	0	Distribution	5
		Regional authorities	0		

7.1.8. **Proposed indicators**

In the following table a list of the final selected indicators for Bari is presented. The table is a result of applying the research methodology, and discussions with the Bari FAL.

Table 7.11: List of selected indicators for Bari FAL

SELECTION OF INDICATORS			
No	**Source***	**Indicators relevant to Bari FAL**	**Comments**
1	CRFS No 10	[Change in] citizens preference/willingness to pay for city region/local food products	Survey
2	CRFS No 34	[Increase in] Number of action plans that are being implemented	
3	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	Linked to CIBA2030 platform
4	CRFS No 36	[Increase in] Number of city residents involved in community - based food activities (education, campaigns, food growing, processing or marketing, communication etc.)	Linked to events and activities promoted by innovators
5	CRFS No 43	[Change in] Consumer knowledge on healthy diets for different age and income groups	Linked to a citizen survey via our CIBA 2030 platform
6	CRFS No 46	[Increase in] Number of urban agriculture/community gardens within the cityregion;	Not sure that will be realized by the end of the project
7	MUFPP [Societal Benefits (Community empowerment)]	[Increase in] Presence of food-related policies and targets with a specific focus on socially vulnerable groups	
8	SAFA [Societal Benefits (Community empowerment)]	[Increase in] Effective participation of citizens/local stakeholders in decision making processes (participation to "food assembly" created after the approval fo the manifesto)	
9	CRFS No 78	[Increase in] Number of jobs resulting from growth in local food economy	Relevant indicator but not sure to have relevant impact by the end of the project
10	CRFS No 167	[Increase in] Investment (funding) in rural-urban infrastructure (e.g. storage facilities, food hubs, transport facilities, wholesale markets etc.)	Linked to food policies to be implemented by the metropolitan city of Bari
11	CRFS No 169	[Increase in] number of policies and plans coherent with the Milan Urban food policy pact	
12	CRFS No 201	[Increase in] Availability of and access to urban agriculture gardens for residents in the city region (per location or income group)	Linked to citizens involved by innovators, FAL activities and the CIBA2030 platform
13	CRFS No 208	[Increase in] Existence and types of policies, regulations and support for preservation of agricultural land; use of open space/ zoning etc. relevant for the city region in both rural and urban areas	Actions implemented by metropolitan city of Bari) not sure that will be realized by the end of the project
14	BCCDC, 2019 [Food & nutrition security (Food availability)]	Annual number of events aimed at shortening supply chains (our local events)	

15	FS	[Increase in] Number of citizens that have been affected (informed/profited/participated) by the FALs operation	
16	FS	[Increase in] Number of citizens that have been informed on local food production	
17	FS	[Increase in] Number of citizens that have been informed on healthy diets	
18	FS	[Increase in] Number of citizens that have been informed on food waste issues	
19	FS	[Increase in] Number of innovators that profited by FAL operations (subscription to ciba2030 platform and network participation)	
20	FS	[Increase in] Number of policy makers and other relevant entities that have been informed	
21	FS	[Increase in] Number of new initiatives driven by the scale up of the BRI innovators involved	Linked to network, platform, and FELs activities
22	FS	[Increase in] Number of young people directly involved in farming/agrifood jobs until 2024	Relevant but not sure to be efficiently assessed
23	FS	[Increase in] Number of new collaborations among actors within the local food value chain	

* Sources for inspiration were the CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.12: Relevance of Bari selected indicators to the impact areas of FS2030

Total indicators		23
Impact areas	Social sustainability and equity	10
	Economic Sustainability	3
	Urban-rural integration	2
	Environmental sustainability	1
	Food governance	3
	Vulnerability and resilience	4

Berlin FAL

7.1.9. FAL DNA overview

In the table below the components that characterize Berlin FAL/ FAL DNA are presented.

Table 7.13: Berlin FAL DNA

BERLIN FAL					
FAL DNA					
BERLIN FAL		**Leader: THF (year 1), Baumhaus (year 2-4) (VEREIN ZUR FORDERUNG EINER NACHHALTIGEN URBANEN KULTUR EV (Baumhaus)) Host: BFPC (Berlin Food Policy Council, BFPC - Ernäringsrat Berlin) Assistant: ZALF (LEIBNIZ-ZENRUM FUER AGRARLANDSSCHAFTFORSCHUNG) + AGRA (AGRATHAER GMBH)**			
FAL MISSION		**"FoodLifeCentre" - Food system transformation through an innovation hub for sustainable regional food supply based on a decentralization concept for food distribution and education**			
FAL GENERAL OBJECTIVES		**Fostering/Building the narrative of local food transition as a common project Rural-urban gap – short supply chain Access to quality food for all Empowerment of local community and citizens Reducing GHG emissions Food education/literacy**			
FAL MEANS	**Healthy food**	Promote access (physical, financial and socio-cultural) to quality food for all Empowerment of citizens to make choices			
	Reducing GHGs emissions	Promoting plant based diets Promote solutions for reducing food waste Promote short supply chains reducing long distance transportation			
	More localised food systems	IT solutions for collective ordering schemes (order and distribution) Social innovation Awareness on local food production Linking producers to food-hubs			
INNOVATION FOCUS		Development of a concept and the establishment of an Urban Food Hub prototype (LebensMittelPunkt) in the Baumhaus			
		Participatory action research (knowledge co-production) to develop an impact assessment and support			
		Developing mechanisms for upscaling and up-scaling of the food hub prototype to different districts and other places			
		Providing political, democratic space for "civic driven actions" for food system transition			
FAL Target group (relevant from 1-5)		Students	2	Community kitchens	5
		Teachers	1	Parents	0
		Citizens	5	Academia/ Education	1
		NGOs	3	Innovation accelarators	5
		Local farmers/producers	5	Local Institutions	2
		Entrepreneurs	2	Local food initiatives	4
		Regional/Local Policy officers/makers	3	Associations dealing with urban gardening	0
		Professional kitchens	0	Social inclusion associations	2
		Teachers trainers	0	Distribution	5
		Regional authorities	2		

7.1.10. Proposed indicators

In the following table a list of the final selected indicators for Berlin is presented. The table is a result of applying the research methodology, and discussions with the Berlin FAL.

Table 7.14: List of selected indicators for Berlin FAL

		SELECTION OF INDICATORS	
No	**Source***	**CRFS Indicators relevant to Berlin FAL - Indicators accepted by ZALF**	**Comments**
1	CRFS No 2	[Decrease in] Distance from household location to UFI for different income groups (or degree of access to UFI within 1 km also referred to as "food deserts")	*Linked to the study on the scaling out of the food hubs based on the 15-min city (1 Km radius)
2	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	*We can give a number of people involved in the food activities in the food hub and using the study on the scaling out extrapolate the results if the whole city was covered by food hubs
3	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	* We can give a number of people involved in the food activities in during the 2021 and 2022 LMP action weeks (Sept-Nov);
4	CRFS No 45	[Increase in] Number of households preparing meals using fresh seasonal ingredients	*We can give an absolute number or to estimate the potential number based on our study on the scaling out of the food hubs
5	CRFS No 66	[Increase in] Number/% of farms in the city region selling direct to consumers (e.g. CSA, box schemes)	*We can give an actual number but not sure about the increase when scaling out the food hubs to the whole city
6	CRFS No 115	[Change in] Types of food products and volumes imported (from outside the city region) compared with similar types of product volumes produced in the city region	*We can give an absolute number on the total amount of food distributed in the food hub from CSA farms, and also an estimation of a potential value when scaling out the food hubs to the whole city
7	CRFS No 132	[Increase in] Total number of farms in city region practicing agro-forestry (eg using crop rotation and on-farm composting/green manures/mulching to maintain soil and plant health and conserve water etc.)	*We could try to give a potential number for the scenario of scaling out of the food hubs to the whole city and the estimation of land needed, considering the average size of the CSA farms
8	CRFS No 141	[Increase in] Number of farms taking part in such initiatives	*We could try to give a potential number for the scenario of scaling out of the food hubs to the whole city and the estimation of land needed, considering the average size of the CSA farms
9	CRFS No 157	[Increase in] Annual volume of total urban safe and nutritious food recovered and redistributed for direct human consumption	*We can give an absolute number on the total amount of food from food sharing in the food hub and/or estimate the potential when scaling out the food hubs to the entire city
10	CRFS No 164	[Improvements to] Presence of and investments in a food policy or strategy	We can give two numbers for the investments of the food strategy (2016-2020) and (2021-2025) - it is relevant for the food hub development (cause the food strategy supports the food hubs politically and financially).
11	CRFS No 173	[Increase in] Diversity of citizen composition in multi-stakeholder groups	We can provide a qualitative response on the Diversity in the Food Policy Council (FAL Host) or the Food Hub (FAL Leader)

12	CRFS No 183	[Improve in] Information available about financial and human resources dedicated to food programmes	Maybe we can provide absolute number, but would need a boundary (which food programme? Only governmental or also by NGOs etc.?) If the 2nd case, then no.
13	CRFS No 198	[Change in] product volumes and diversity of food imported (from outside the city region) compared with food produced within the city region	*We can give an absolute number on the total amount of food distributed in the food hub from CSA farms, and also an estimation of a potential value when scaling out the food hubs to the whole city
14	FS	[Increase in] Number of new prototypes (Urban Food Hubs) that have been created	
15	FS	[Increase in] Number of citizens that have been affected (informed/profited/participated) by the Hub's day-to-day operation	
16	FS	[Increase in] Number of citizens that have been informed	
17	FS	[Increase in] Number of citizens that have been profited by the Hub's day-to-day operation (served meals)	
18	FS	[Increase in] Number of healthy meals served in the Hub	
19	FS	[Increase in] Number of citizens that have worked as volunteers for the Hub	
20	FS	[Increase in] New jobs that have been created	
21		[Decrease in] How much food waste has been saved (kg, %)	
22	FS	[Decrease in] Meat consumption that has been substituted by more plant-based diets (kg, %)	
23	FS	[Increase in] Number of civic driven actions that have been implemented	

* Sources for inspiration were CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.15: Relevance of Berlin selected indicators to the impact areas of FS2030

Total indicators		23
Impact areas	Social sustainability and equity	12
	Economic Sustainability	1
	Urban-rural integration	1
	Environmental sustainability	5
	Food governance	3
	Vulnerability and resilience	1

Brasov FAL

7.1.11. FAL DNA overview

In the table below the components that characterize Brasov FAL/ FAL DNA are presented.

Table 7.16: Brasov FAL DNA

BRASOV FAL					
FAL DNA					
BERLIN FAL		**HIGHCLERE CONSULTING SRL - HCC (Leader)** **AGENTIA METROPOLITANA PENTRU DEZVOLTARE DURABILA BRASOV ASOCIATA (Host)** **ICEBERG CONSULTING SRL (Assistant)**			
FAL MISSION		**"Interactive Food Lab" - Integrating traditional and local producers into an innovative and ambitious regional food system**			
FAL GENERAL OBJECTIVES		**Promoting short supply chains** **Better connectivity between urban and rural areas** **Healthy diets through promotion of local products** **Local economy enforcement** **Less food waste in restaurants and public catering** **Process innovation**			
FAL MEANS	**Healthy food**	Awareness on healthy diets (indirectly) Promote local organic products and dishes Raising awareness so local producers can have access to local food procurement			
	Reducing GHGs emissions	Promote short supply chain Awareness on food waste prevention Promoting more sustainable (climate adaptive) farming practices for local farmers			
	More localised food systems	Applying public procurement procedures to increase local products proportion IT solutions to shorten the distance and capacity building for local production Social innovation Awareness on local food production Promote local products and menus Improve access of local producers in the city market			
INNOVATION FOCUS		Fostering a more localised food economy and reviving the gastronomic heritage of the region			
		Local food product innovation (including capitalising on the commercial gastronomical potential of the region and incorporating plant-based nutrition			
		Innovation in public policies (notably procurement for public catering)			
		Innovation in marketing and supply chain management with an emphasis on ICT			
FAL Target group (relevant from 1-5)		Students	0	Community kitchens	1
		Teachers	0	Parents	0
		Citizens	0	Academia/ Education	2
		NGOs	3	Innovation accelarators	2
		Local farmers/producers	5	Local Institutions	4
		Entrepreneurs	5	Local food initiatives	1
		Regional/Local Policy officers/makers	3.5	Associations dealing with urban gardening	1
		Professional kitchens	0	Social inclusion associations	0
		Teachers trainers	0	Distribution	0
		Regional authorities	1		

7.1.12. Proposed indicators

In the following table a list of the final selected indicators for Brasov is presented. The table is a result of applying the research methodology, and discussions with the Brasov FAL.

Table 7.17: List of selected indicators for Brasov FAL

		SELECTION OF INDICATORS	
No	**Source***	**Indicators relevant to the Brasov FAL**	**Comments**
1	CRFS No 7	[Change in] Food prices for different food products or commodities and for local versus non local foods)	
2	CRFS No 9	[Decrease in] Cost of a healthy food basket in the nearby market - (this can also be compared with average income levels for specific groups)	
3	CRFS No 10	[Change in] citizens preference/willingness to pay for city region/local food products	
4	CRFS No 17	[Change in] Household food consumption and expenditure patterns on processed and fast foods by income groups	
5	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	
6	CRFS No 29	[Increase in] Annual number and type of nutritious food promotion initiatives (e.g.aimed at companies or the public)	
7	CRFS No 30	[Increase in] Presence of policies or regulations promoting healthier food ingredients/consumption	
8	CRFS No 31	[Change in] Annual number and percentage of children benefiting from school feeding programmes	
9	CRFS No 34	[Increase in] Number of sustainable and local food public procurement policies and action plans that are being implemented	
10	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	
11	CRFS No 46	[Increase in] Number of urban agriculture/community gardens within the city region; in low-income areas	
12	CRFS No 47	[Increase in] Number of city residents involved with urban food growing	
13	CRFS No 48	[Increase in] Numbers of *young people educated in quality food, nutrition and environmental protection through local food programmes	
14	CRFS No 49	[Change in] Consumer awareness on healthy diets/ safe food/ environmental impacts of their food consumption among different groups	
15	CRFS No 63	[Increase in] Number of brands and labels developed for food from the city region (e.g. “local food”) ???	
16	CRFS No 64	[Increase in] Number of food businesses actively sourcing ingredients produced/processed in the city region	
17	CRFS No 65	[Increase in] Number of policies, programmes or instruments to promote food from the city region (production, consumption)	
18	CRFS No 66	[Increase in] Number/% of farms in the city region selling direct to consumers (e.g. CSA, box schemes)	
19	CRFS No 67	[Increase in] Number/% of farms in the city region trading direct at markets	
20	CRFS No 68	[Increase in] Number/% of farms in the city region selling direct to retailers or caterers	
21	CRFS No 76	[Increase in] Total value of annual sales of food produced in the city-region to customers based in the city region	
22	CRFS No 77	[Change in] Total consumer expenditure on “local food”	
23	CRFS No 78	[Increase in] Number of jobs resulting from growth in local food economy	
24	CRFS No 79	[Increase in] Procurement of local/total food from local sources by public institutions (municipal agencies, publicly funded community organisations, schools, hospitals, health clinics. prisons, universities)	
25	CRFS No 85	[Increase in] Number of viable independent local food businesses and farms (farm profitability)	
26	CRFS No 88	[Increase in] Number of food businesses increasing the diversity of income streams (eg agri-tourism; product value addition; education; training etc)	
27	CRFS No 105	[Increase in] Number of development support programmes for food businesses with a focus on improving i) performance (efficiency, profitability, marketing) and ii) sustainability, (reduced GHG emissions etc)	
28	CRFS No 111	[Increase in] Total surface area and production volumes of agriculture/community gardens within the city region; in low income areas	

29	CRFS No 112	[Increase in] Percentage of total surface areas (current and potentially available currently unfarmed) available for food production within the city region	
30	CRFS No 118	[Increase in] Types of market opportunities available to city region food producers (e.g. farmers markets, public sector food procurement, direct to consumers)	
31	CRFS No 119	[Increase in] Types and numbers of outlets where regional products are sold in the city	
32	CRFS No 124	[Increase in] Number of food procurement contracts which purchase products from the city region	
33	CRFS No 125	[Increase in] Annual volume of food produced in the city region and consumed in the city	
34	CRFS No 131	[Change in] Total i) area of agricultural land and ii) number of farms in the city region (rural and urban) for different identifiable production systems (eg organic, agro-ecological, conventional, intensive livestock, GM etc)	
35	CRFS No 169	[Increase in] level of coherence of policies and plans that at national level ensure the linkages with the local food system policies	
36	CRFS No 171	[Increase in] Presence and type of multi-stakeholder food policy and planning structures (e.g. food policy councils; food partnerships; food boards; food coalitions)	
37	CRFS No 175	[Increase in] Number of i) women and ii) young people participating in governance structures	
38	FS	[Increase in] Number of citizens that have been affected (informed/profited/participated) by the FALs operation	
39	FS	[Increase in] Number of citizens that have been informed on food waste issues	
40	FS	[Increase in] Number of policy makers and other relevant entities that have been informed	

* Sources for inspiration were CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.18: Relevance of Brasov selected indicators to the impact areas of FS2030

Total indicators		40
Impact areas	Social sustainability and equity	22
	Economic Sustainability	7
	Urban-rural integration	6
	Environmental sustainability	1
	Food governance	4
	Vulnerability and resilience	0

Copenhagen FAL

7.1.13. FAL DNA overview

In the table below the components that characterize Copenhagen FAL/ FAL DNA are presented.

Table 7.19: Copenhagen FAL DNA

COPENHAGEN FAL					
FAL DNA					
Lab Organisational Committee		**Leader: UCPH (year 1), CFSC (year 2-4) Host: Lejre Assistant: CFT + UCPH**			
FAL MISSION		**"Kitchen of tomorrow" - To strengthen the regional food system by creating awareness, recognition and learning about food system transition based on selected innovation actions**			
FAL GENERAL OBJECTIVES		**Urban-rural cooperation towards sustainable food systems Citizen engagement platforms Upcycled food Empowerment of local society**			
FAL MEANS	**Healthy food**	-			
	Reducing GHGs emissions	Awareness on a more plant based diet in public and private kitchens Awareness on circular economy Apply solutions through upcycling Collection and analysis of relevant data to support the food system agenda and create awareness and recognition			
	More localised food systems	Fostering the utitlisation of online platforms to enhance citizens engagement with various actors in the food system Building hubs and infrastructure to strengthen functions and connections. Awareness about local food production Awareness of revision of national food related policies			
INNOVATION FOCUS		Urban-rural cooperation towards sustainable food systems			
		Citizen engagement platforms			
		Empowerment of local society			
		Upcycled food			
Target group (relevant from 1-5)		Students	0	Community kitchens	0
		Teachers	0	Parents	0
		Citizens	4	Academia/ Education	0
		NGOs	2	Innovation accelarators	0
		Local farmers/producers	5	Local Institutions	0
		Entrepreneurs	5	Local food initiatives	0
		Regional/Local Policy officers/makers	3	Associations dealing with urban gardening	0
		Professional kitchens	5	Social inclusion associations	0
		Teachers trainers	0	Distribution	3
		Regional authorities	3		

7.1.14. Proposed indicators

In the following table a list of the final selected indicators for Copenhagen is presented. The table is a result of applying the research methodology, and discussions with the Copenhagen FAL.

Table 7.20: List of selected indicators for Copenhagen FAL

		SELECTION OF INDICATORS	
No	**Source***	**Indicators relevant to Copenhagen FAL**	**Comments**
1	CRFS No 10	[Change in] citizens preference/willingness to pay for city region/local food products	Could support our local food innovators in upscaling their activities, and themselves increasing willingness to pay, but can't measure willingness to pay ourselves as a FAL
2	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	
3	CRFS No 30	[Increase in] Presence of policies or regulations promoting healthier food ingredients/consumption	
4	CRFS No 36	[Increase in] Number of city residents involved in community – based food activities (education, campaigns, food growing, processing or marketing, communication etc.)	Lejre kommune is aware of such events, could measure n. or gardens, n. of events, for example
5	CRFS No 39	[Increase in] Number of food education services that involve other food system actors (farmers, cooks, food vendors, policy makers) as educators	We are working with educational institutions, as well as co-hosting educational events.
6	CRFS No 45	[Increase in] Number of households preparing meals using fresh seasonal ingredients	Could potentially measure box subscriptions with local CSAs
7	CRFS No 66	[Increase in] Number/% of farms in the city region selling direct to consumers (e.g. CSA, box schemes)	Interesting metric we would benefit from, however not planning to do this ourselves
8	CRFS No 67	[Increase in] Number/% of farms in the city region trading direct at markets	Counting the number of farms supplying professional kitchens, but not planning to measure whether its their first/ only time supplying the city
9	CRFS No 68	[Increase in] Number/% of farms in the city region selling direct to retailers or caterers	Counting the number of farms supplying professional kitchens, but not planning to measure whether its their first/ only time supplying the city
10	CRFS No 78	[Increase in] Number of jobs resulting from growth in local food economy	
11	CRFS No 114	[Change in] Total volumes of annual local food sales in the city region for different market types (e.g. farmers markets, public sector food procurement, direct to consumers)	This data exists in Denmark, but has to be paid for. To be considered
12	CRFS No 115	[Change in] Types of food products and volumes imported (from outside the city region) compared with similar types of product volumes produced in the city region	This data exists in Denmark, but has to be paid for. To be considered
13	CRFS No 117	[Increase in] Types and numbers of local supply/value chains ie entire chain is located within the city region	This data exists in Denmark, but has to be paid for. To be considered
14	CRFS No 118	[Increase in] Types of market opportunities available to city region food producers (e.g. farmers markets, public sector food procurement, direct to consumers)	This data exists in Denmark, but has to be paid for. To be considered
15	CRFS No 119	[Increase in] Types and numbers of outlets where regional products are sold in the city	This data exists in Denmark, but has to be paid for. To be considered

16	CRFS No 120	[Increase in] Types and numbers of outlets where regional products are sold in the city	This data exists in Denmark, but has to be paid for. To be considered
17	CRFS No 128	[Increase in] Annual volumes of city-generated organic waste recycled in the city region food system	This data exists in Denmark, but has to be paid for. To be considered
18	CRFS No 137	[Increase in] Number of systems for transparency and traceability providing information the consumer about the way food is grown, processed and sold; (e.g. environmental labelling schemes for food products).	Several of our innovators are working on this
19	CRFS No 158	[Increase in] Annual volume of food waste recycled in feed, as context allows	Circular Food Technology is working on this, might be monitoring this
20	CRFS No 159	Presence of policy or strategy that appropriately addresses practical issues of i) food loss and waste prevention, ii) reduction and iii) recycling	Circular Food Technology is working on this
21	CRFS No 160	[Increase in] Number of local/regional policies and programmes that adhere to national food loss and waste programmes and guidelines	Circular Food Technology is working on this
22	CRFS No 166	[Increase in] Number of rural-urban linkages that feature in city region food policies, structures and plans	To be considered
23	CRFS No 170	[Increase in] Frequency and new forms of cross-sectoral and cross-jurisdictional collaboration in food systems policies and programmes	To be considered

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.21: Relevance of Copenhagen selected indicators to the impact areas of FS2030

Total indicators		23
Impact areas	Social sustainability and equity	9
	Economic Sustainability	1
	Urban-rural integration	7
	Environmental sustainability	4
	Food governance	2
	Vulnerability and resilience	0

Ostend FAL

7.1.15. FAL DNA overview

In the table below the components that characterize Ostend FAL/ FAL DNA are presented.

Table 7.22: Ostend FAL DNA

OSTEND FAL					
FAL DNA					
Lab Organisational Committee		**Leader: Ostend** **Host: Ostend** **Assistant: EV ILVO**			
FAL MISSION		**"City Agro-Park" - Develop a food strategy for the city, in which the newly developed agricultural park Gardens of Stene are the engine for stimulating the local food dynamics**			
FAL GENERAL OBJECTIVES		**Develop food strategy** **Further operationalisation of the agricultural park** **Awareness raising about sustainable food**			
FAL MEANS	**Healthy food**	Develop a food strategy, including operational objectives on consumption of healthy food. Awareness on healthy diets (inhabitants, schools, etc) City council giving the good example (at receptions etc) Workshops demonstrating reparation of healthy meals			
	Reducing GHGs emissions	Develop a food strategy, including operational objectives on sustainable transport modes and on food waste. Awareness on food waste Applying public procurement procedures to reduce climate risk/ to boost sustainability Apply solutions for food waste upcycling			
	More localised food systems	Develop a food strategy, including operational objectives on local food production (identify opportunities, new developments, networks) Awareness on local food production Applying public procurement procedures to increase local products proportion Build a network of local food producers Social innovation			
INNOVATION FOCUS		Develop a food strategy for the city, in which the newly developed agricultural park Gardens of Stene are the engine for stimulating local food dynamics			
		Strengthen the link between local food producers and catering sector			
		Produce high quality education (awareness raising) on local products, short food supply chains and food waste targeted at chefs			
		Awareness raising with citizens on short food supply chains and healthy diet			
		Combating poverty by supporting vulnerable societal groups with food initiatives			
Target group (relevant from 1-5)		Students	1	Community kitchens	0
		Teachers	2	Parents	0
		Citizens	4	Academia/ Education	0
		NGOs	0	Innovation accelarators	0
		Local farmers/producers	5	Local Institutions	0
		Entrepreneurs	3	Local food initiatives	0
		Regional/Local Policy officers/makers	0	Associations dealing with urban gardening	0
		Professional kitchens	3	Social inclusion associations	0
		Teachers trainers	0	Distribution	0
		Regional authorities	0		

7.1.16. Proposed indicators

In the following table a list of the final selected indicators for Ostend is presented. The table is a result of applying the research methodology, and discussions with the Ostend FAL.

Table 7.23: List of selected indicators for Ostend FAL

		SELECTION OF INDICATORS	
No	**Source***	**CRFS Indicators relevant to the FAL - SELECTED by DRAXIS (15/02/22)**	**Comments**
1	CRFS No 1	[Change in] Number of UFI (Urban Food Initiatives* /projects (ex. Hubs, social centres, social gardens, social kitchens, healthy food retail outlets, etc.) located in or near to low-income neighbourhoods that promote fresh fruit & vegetables	Need for a definition of the UFI in this respect
2	CRFS No 10	[Change in] citizens preference/willingness to pay for city region/local food products	Use the data of the city monitor for Flanders.
3	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	Need for definition or description
4	CRFS No 34	[Increase in] Number of sustainable and local food public procurement policies and action plans that are being implemented	At Flemish level?
5	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	
6	CRFS No 46	[Increase in] Number of urban agriculture/community gardens within the city region; in low-income areas	This won't evolve much
7	CRFS No 65	[Increase in] Number of policies, programmes or instruments to promote food from the city region (production, consumption)	Look at this at a provincial level
8	CRFS No 79	[Increase in] Procurement of local/total food from local sources by public institutions (municipal agencies, publicly funded community organisations, schools, hospitals, health clinics. prisons, universities)	Definition? Is one local product enough or what is the threshold?
9	CRFS No 160	[Increase in] Number of local/regional policies and programmes that adhere to national food loss and waste programmes and guidelines	
10	CRFS No 162	[Increase in] Number of (new) regulations, incentives, municipal budget allocations, task forces and committees, programmes and pilots on city region food system activities and local food	Need for definition or description
11	CRFS No 163	[Improvements to] Presence of an interdepartmental government body for decision making on food policy and programmes	Will not evolve much
12	CRFS No 164	[Improvements to] Presence of and investments in a food policy or strategy	
13	CRFS No 201	[Increase in] Availability of and access to urban agriculture gardens for residents in the city region (per location or income group)	Possible overlap with previous indicator
14	FS	[Increase in] Number of civic driven actions that have been imlemented	
15	Social grocery	Amount of food collected for the food distribution platform	
16	Social grocery	Number of people receiving fresh food from the social grocery	
17	Buitengoed	Number of students in educational activities in the Gardens of Stene	
18	City of Ostend	% of people buying organic food	they are measured at the regional level every 3 years

19	City of Ostend	% of people eating locally grown fruit & veg	they are measured at the regional level every 3 years
20	City of Ostend	% eating vegetarian	they are measured at the regional level every 3 years
21	City of Ostend	% buying seasonal fruit & veg	they are measured at the regional level every 3 years
22	City of Ostend	% buying fair trade products	they are measured at the regional level every 3 years
23	City of Ostend	% avoiding plastic waste	they are measured at the regional level every 3 years
24	City of Ostend	% drinking tap water	they are measured at the regional level every 3 years

* Sources for inspiration were CRFS framework, the FoodSHIFT2030 (FS) research team, City of Oostende, Social Grocery, and Buitengoed.

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.24: Relevance of Ostend selected indicators to the impact areas of FS2030

Total indicators relevant to the CRFS Framework		24
Impact areas	Social sustainability and equity	11
	Economic Sustainability	2
	Urban-rural integration	1
	Environmental sustainability	3
	Food governance	4
	Vulnerability and resilience	3

Wroclaw FAL

7.1.17. FAL DNA overview

In the table below the components that characterize Wroclaw FAL/ FAL DNA are presented.

Table 7.25: Wroclaw FAL DNA

WROCLAW FAL					
FAL DNA					
Lab Organisational Committee		**Leader: FER** **Host: Wroclaw** **Assistant: WUELS**			
FAL MISSION		**"Accessible Food Gardens" - Strengthening of innovation potential of local sustainable food system**			
FAL GENERAL OBJECTIVES		**Awareness-raising through education (citizens, schools, educators, experts, etc) - individual & local contribution through community gardens/ responsible consumption/building local communities/etc to build local resilience Small-scale living** **Increasing/boosting local resilience** **Rural-urban gap** **Active participation by gardening**			
FAL MEANS	**Healthy food**	Prototyped edible gardens in schools and kindergartens and provide education on permaculture and zero-waste Education on preparation of healthy meals or other actual solutions Toolbox with basic seeds			
	Reducing GHGs emissions	Promoting local producers Twinning local producers and urban eaters Awareness on food waste via Prototyped edible gardens in schools & kindergartens			
	More localised food systems	Identify & promote local producers – direct sales, access in markets Promote social innovation & personal responsibility of urban ecosystems via environmental awareness education Enhanced innovative potential of project stakeholders by providing workshops on social innovations concerning food, citizen co-created spatial intelligence of food system solutions Twinning local producers & urban eaters Prepare info on how to develop urban garden - knowledge database of available & suitable places/areas in the municipality			
INNOVATION FOCUS		Increase the accessibility of food gardens to different social and aging groups by creating linkages between sustainable local food producers and consumers, education and engagement of stakeholders.			
		Creating a model for establishing new social gardens with trainings and material support of an urban gardener (Toolbox with basic seeds, seedlings)			
		Engage young generations with urban farming by providing education and capacity building relating to permaculture, plant-based nutrition, zero-waste, importance of pollinators and circular economy solutions.			
		Create & establish innovative community gardens to be replicated & applied in other cities.			
Target group (relevant from 1-5)		Students	2	Community kitchens	0
		Teachers	3	Parents	0
		Citizens	5	Academia/ Education	0
		NGOs	2	Innovation accelarators	0
		Local farmers/producers	5	Local Institutions	0
		Entrepreneurs	0	Local food initiatives	0
		Regional/Local Policy officers/makers	2	Associations dealing with urban gardening	0
		Professional kitchens	1	Social inclusion associations	0
		Teachers trainers	0	Distribution	0
		Regional authorities	0		

7.1.18. Proposed indicators

Table 7.26: List of selected indicators for Wroclaw FAL

		SELECTION OF INDICATORS	
No	Source*	Indicators relevant to Wroclaw FAL	Comments
1	Relevant to CRFS No 1	[Change in] Number of UFI (Urban Food Initiatives* /projects: community gardens, edible gardens at schools, CSA etc.)	
2	CRFS No 14	[Change in] Number and type of people using UFI that address food access	
3	CRFS No 26	[Increase in] Number of people involved in physical and social community food activities (e.g. cooking classes, gardening groups)	
4	CRFS No 35	[Increase in] Number of practical food education opportunities provided at the community level (cooking classes, nutrition education, food growing)	
5	CRFS No 36	[Increase in] Number of city residents involved in community –based food activities (education, campaigns, food growing, processing or marketing, communication etc.)	
6	CRFS No 46	[Increase in] Number of urban agriculture/community gardens within the city region; in low-income areas	
7	CRFS No 201	[Increase in] Availability of and access to urban agriculture gardens for residents in the city region (per location or income group)	
8	FS	[Increase in] Number of citizens that have been affected (informed/profited/**participated**) by the FALs operation	
9	FS	[Increase in] Number of policy makers and other relevant entities that have been informed	
10	EC, FOOD 2030 WORKSHOP OUTCOMES BRIEF [Food & nutrition security/Food access]	Number of social fridges per unit area (public foodsharing refrigerators and shelves)	
11	[Societal Benefits/Social cohesion]	[Increase in] Number of and interaction in food networks	

* Sources for inspiration were mainly CRFS framework and of FoodSHIFT2030 (FS) research team

Relevance of selected indicators to the impact areas of the FS2030 project:

Table 7.27: Relevance of Wroclaw selected indicators to the impact areas of FS2030

Total indicators relevant to the CRFS Framework		11
Impact areas	Social sustainability and equity	8
	Economic Sustainability	0
	Urban-rural integration	0
	Environmental sustainability	0
	Food governance	2
	Vulnerability and resilience	1

8. Conclusions

The indicators produced, as part of this deliverable, are an important element of the FoodSHIFT2030 project. Through measuring these indicators, the FALs (located in Athens, Avignon, Barcelona, Bari, Berlin, Brasov, Copenhagen, Ostend, and Wroclaw) will be able *to assess the current state of their food system and the benefits of their food system innovations*.

During the selection procedure, apart from satisfying the FoodSHIFT2030 above objective there was also an effort to:

- Connect the indicators with an established framework in order the FoodSHIFT project to work as a reference for possible further efforts of the FALs and liaison more easily with the work of external interested parties if wished.
- Produce indicators that are possible to be measured in the scale of each FAL.
- Start the discussion, and provide food for thought for the FALs mission, targets, and future steps.
- Provide a basis for interaction between the different FALs, and facilitate the discussion, and exchange of experiences, also in the coming steps and tasks of the FoodSHIFT project.

The final product of this deliverable is 9 lists with 218 total selected indicators for all of the FALs. Namely:

FAL	*ATH*	*AVG*	*BRC*	*BRI*	*BER*	*BRA*	*CPH*	*OST*	*WRO*
Number	37	16	21	23	23	40	23	24	11

The indicators selected are focusing primarily on *FAL level*, and will be counted *for the project duration*. What was constated during a number of interactions with the FALs was, that the context (FAL DNA) of the nine FALs is quite wide and differentiated. They are all involved in a *variety of separate activities*. There is also *a variety of target audience*s for the FALs. Also, the FALs implementation scale significantly differs among the different FALs. Although the majority of the activities focus in the LAB scale, the scale of the organisations responsible for the operation of the FALs varies considerably, varying from the level of a private school, to the level of a municipal authority. This has an effect on the food system components each FAL affects. Therefore, for each of the FALs a different approach was used. This was made in order to match its different character and needs, both in matter of mission, targets, but also of FAL resources.

The tables are a result of applying the research methodology, literature review, and an intense consultation with the FALs and Subtask Leaders. When possible, the indicators selected, were matched with the relevant indicators from the CRFS Framework, nevertheless, when not possible, changes were made to match the FALs needs. Also, new indicators where created in order to cover the particular character of each FAL and be able to assess, as holistically as possible, each FAL.

The chosen indicators, if used appropriately, are a tool that can be quite beneficial for the project as a whole, the FALs, and each of the partners and entities involved. Various profits can derive, that can help FALs, and all the project's partners, to measure whether their outcome and objectives have been achieved, and possibly get guided on future applications, improving, and fine-tuning forthcoming actions. The indicators selected, correspond to the food system components and the impact areas of the FoodSHIFT2030 project. Namely, environmental sustainability, social sustainability and equity, economic sustainability, urban-rural integration, vulnerability and resilience, and food govevernance.

The indicators produced were chosen accordingly, to bring in the surface reliable and comprehensible information from the FALs activities, which will be accessible as well, to all external interested and involved parties (ex. international organizations, companies, government agencies, citizens, etc.). In addition, the indicators are aiming to communicate results, and enable and/or facilitate the implementation of similar actions and the exchange of experience gained through the FS2030 project. These results can be used and elaborated furthermore in the future, serving as a base for FALs upcoming activities.

The indicators are suggested to be measured in two overall scales, namely in the prototype scale, and in the FAL's final scale, including the results from the maturing of the FALs, the innovators, as well as the on-boarding FELs.

The work of indicators does not stop here. The whole process is quite dynamic and will be only finalised, by the end of the project and the full assessment of the project's results. The list of indicators provided for each of the FALs are only the start, providing a solid base for the future steps.

The next steps

The indicators selected and created, as part of this Deliverable (D3.2), will be later used in particular in the coming Task T3.4. For the next steps, and for making use these indicators in the best way for **setting & executing the implementation plan** the following questions should be considered:

- What are your monitoring objectives?
- Are there quantified targets to be reached?
- Who is responsible to collect and record the data?
- How often will the data collection/recoding take place?
- Is there a need for periodic progress reporting?
- Who will analyse and evaluate the reported progress?

Further on for **reassessing the indicators** the following questions should be considered:

- How often should the indicators be reassessed?
- How often are the results evaluated?
- Is there a need for identification of gaps?
- Which are the "new" issues that need to be addressed?

9. References

Barilla/EIU (2018). Food Sustainability Index, the Economist Intelligence Unit and the Barilla Center for Food & Nutrition Foundation

Bayo, Manuel & Mirón, I., (2006). A flexible framework for regional sustainable development indicators using system thinking criteria (INSURE).

Bogdanski, A., Giuntoli, J., Mubareka, S., Gomez San Juan, M., Robert, N. & Tani, A. 2021. Guidance Note on Monitoring the Sustainability of the Bioeconomy at a Country or Macro-regional Level. Environment and Natural Resources Management Working Papers – Bioeconomy, No. 90. Rome, FAO and EC-JRC. https://doi.org/10.4060/cb7437en

Carey J., Dubbeling M. (2017), City Region Food SystemIndicator Framework – City Region Food System ToolkitAssessing and planning sustainable city region food systems, developed by FAO, RUAF Foundation and Wilfrid Laurier University

Carey J., Dubbeling M. (2017), City Region Food SystemIndicator Framework – City Region Food System ToolkitAssessing and planning sustainable city region food systems, developed by FAO, RUAF Foundation and Wilfrid Laurier University.

Coastal Wiki, http://www.coastalwiki.org/wiki/Sustainability_indicators, last access on 18/04/22

Defra (2009), Indicators for a Sustainable Food System, Available at: https://webarchive.nationalarchives.gov.uk/20130125171715/http://www.defra.gov.uk/statistics/files/defra-stats-foodsystemindicators.pdf

DEVCO (Directorate-General for International Cooperation and Development) (2016) 'Annex 7: Monitoring and indicators', in Integrating the environment and climate change into EU international cooperation and development: Towards sustainable development. Tools and Methods Series Guidelines 6. Brussels: DEVCO.

EEAa (2003), Environmental Indicators: Typology and Use in Reporting, European Environment agency, Copenhagen, Denmark

EEAb (2003), Environmental Indicators: Typology and Use in Reporting, European Environment agency, Copenhagen, Denmark.

EIU, Global Food Security Index, Available at: https://foodsecurityindex.eiu.com/

EPA (2008), Indicator Development for Estuaries manual, U.S. Environmental Protection Agency, Office of Water

EPA. 1994. Measuring Progress of Estuary Programs: A Manual. U.S. Environmental Protection Agency, Office of Water (4504F). EPA 842-B-94-008. November 1994.

European Commission, 2005 (EC, 2005). Measuring progress towards a more sustainable Europe. Sustainable Development indicators for the European Union

Eurostat, Sustainable Development Indicators, Available at: https://ec.europa.eu/eurostat/web/sdi/no-poverty

FAO – Statistics, Food Security Indicators, Available at: http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.XmtOY3KxXb0

FAO, 2013. Sustainability Assessment of Food and Agriculture Systems: Guidelines, Version 3.0. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/SAFA_Guidelines_Version_3.0.pdf.

FAO, Sustainable Food Systems, Concept and framework (2018)

FAOSTAT, Selected Indicators, Available at: http://www.fao.org/faostat/en/#country

Garnett, T., Benton, T., Nicholson, W., & Finch, J. (2016). Overview of food system challenges (Foodsource: chapters). Food Climate Research Network, University of Oxford.

Gasso, V., Oudshoorn, F.W., de Olde, E., Sorensen, C.A.G., 2015. Generic sustainability assessment themes and the role of context: The case of Danish maize for German biogas. Ecol. Indic. 49, 143–153.

Gudmundsson, H., 2003. The policy use of environmental indicators—learning from evaluation research. The Journal of Transdisciplinary Environmental Studies 2, 1–11.

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, Rome.

Milan Urban Food Policy Pact (MUFFP), Monitoring framework indicators, Available at: http://www.milanurbanfoodpolicypact.org/milan-urban-food-policy-pact-monitoring-framework/

OECD (1993), OECD Core Set of Indicators for Environmental Performance Reviews - A synthesis report by the Group on the State of the Environment, Environment Monographs N° 83, Paris

OECD (2003), OECD Environmental Indicators – Development, Measurement and Use

Olsson, Johanna Alkan, Bockstaller, Christian, Stapleton, Lee M, Ewert, Frank and et al, (2009) A goal oriented indicator framework to support integrated assessment of new policies for agri-environmental systems. Environmental Science and Policy, 12 (5). pp. 562-572. ISSN 1462-9011

Richard L. Daft, Patricia G. Lane, Management, Ninth Edition, 2010, South-Western, Cengage Learning

SAM (2019). 'A scoping review of major works relevant to scientific advice towards an EU sustainable food system', The Scientific Advice Mechanism Unit of the European Commission, 26 p. web version

Scialabba, Nadia & Grenz, Jan & Henderson, Elisabeth & Nemes, Noemi & Sligh, Michael & Stansfield, John & Lee, Sally & Brugère, Cecile & Bentacur, Marta & Kneeland, Doug & Larrea, Cristina & Bianchi, Gabriella. (2013). Sustainability Assessment of Food and Agriculture systems (SAFA) Indicators.

The Heinz Center. 2003. The Coastal Zone Management Act: Developing a Framework for Identifying Performance Indicators. The H. John Heinz III Center for Science, Economics and the Environment.

UN General Assembly (2015), Transforming our world : the 2030 Agenda for Sustainable Development, 21 October 2015

UNDESA, 2007. Indicators of Sustainable Development: Guidelines and Methodologies. October 2007, Third Edition. ISBN 978-92-1-104577-2.

United Nations (UN), Indicators of Sustainable Development: Guidelines and Methodologies, Second Edition, UN Sales Publication No.E.01.II.A.6 (New York, September 2001).

Walz, R. (2000), Development of environmental indicator systems: Experiences from Germany, Environmental Management Vol. 25, No 6, pp. 613–623, Springer-Verlag NY

Zurek M., Ingram J., Zimmermann A., Garrone M., Rutten M., Tetens I., Leip A., van 't Veer P., Verain M., Bouwman E., Marette S., Chang C., Latka C., Hornborg S., Ziegler F., Vervoort J., Achterbosch T., Havlik P., Terluin I., Achterbosch T., Deppermann A., (2016), Deliverable 1.1: A Framework for Assessing and Devising Policy for Sustainable Food and Nutrition Security in EU: The SUSFANS conceptual framework, (SUSFANS project)

Zurek M., Leip A., Kuijsten A., Wijnands J., Terluin I., Shutes L., Hebinck A., Zimmermann A., Götz C., Hornborg S., van Zanten H., Ziegler F., Havlik P., Garrone M., Geleijnse M., Kuiper M., Turrini A., Dofkova M., Trolle E., Mistura L., Dubuisson C., van 't Veer P., Achterbosch T., Cuaresma J.C., Ingram J., (2017), Deliverable 1.3: Sustainability metrics for the EU food system: a review across economic, environmental and social considerations, Metrics, Models and Foresight for European SUStainable Food And Nutrition Security (SUSFANS project)

10. ANNEXES

ANNEX I: Relevant indicator frameworks

When attempting to develop a set of indicators, the framework under which they will be organised should be decided first, i.e. the conceptual model on which the definition and development of indicators will be based upon. In addition, it should be made clear, especially when using indicators to draw conclusions, that they are not merely quantitative variables that take on numerical or statistical values. The aim is, through appropriate utilization, to be able to investigate, clarify, and highlight the socio-political-environmental interactions that are inherent in, and affect a system.

Driver Pressure State Impact Response

In 1993 the Organization for Economic Co-operation and Development (OECD) introduced a new approach to implementing environmental policy and monitoring. This new approach refered to the creation of a common conceptual model/framework for the development and definition of environmental indicators. This framework addresses the interaction and interdependence of three components, namely the pressures exerted on the environment by human activities (Pressure), the impact these have on the state of the environment - quality and quantity of natural resources (State), and how the society responds to these changes (Response) through sectoral and economic policies and changes in the level of awareness[14]. The main feature of the proposed framework is the emergence of cause-effect relationships between these three components with the ultimate goal of understanding the interdependence between economy, environment, and society. A key element here is that while connections and interactions are highlighted, they are not categorized and/or evaluated as positive or negative[14].

According to the PSR framework, environmental indicators can be divided into three broad categories[5]:

- *Indicators of environmental pressures*; include the pressures exerted by human activity on the natural and man-made environment and which may be indirect or even direct. These indicators are closely linked to consumption and production patterns. Example of a such an indicator is the emissions of dangerous substances.
- *Environmental status indicators*; are related to the quality of the environment and both the quality and the quantity of natural resources.Examples of such an indicator are the exposure of the population to certain levels of pollution and the state of wildlife and ecosystems and natural resource reserves.
- *Indicators of social response*; show the degree of response of society to environmental issues. These indicators relate to individual and collective actions and reactions either to address pre-existing environmental problems or to avoid the creation of young people. Examples of such an indicator are environmental taxes as well as the rate of waste recycling.

Following the model mentioned above, the European Environmental Agency (EEA)[15] has proposed a modified working framework for the development of environmental indicators. The new framework concerns the connections that are being developed between five components this time. An approach to the problem is attempted based on the interaction between the driving forces (Driving forces), the

[14] OECD (2003), OECD Environmental Indicators – Development, Measurement and Use
[15] EEA[b] (2003), Environmental Indicators: Typology and Use in Reporting, European Environment agency, Copenhagen, Denmark.

environmental pressures (Pressure), the state of the environment (State), the environmental impacts (Impact) and the social response (Response).

The five interrelated components can be expressed through indicators related to the following[15]:

- *Driving force indicators*; describe the social, demographic and economic developments of a society and the corresponding changes in lifestyle, consumption levels and productive patterns.
- *Indicators of environmental pressures*; describe developments in substance releases, resource use and land use from human activities. In essence, the pressures exerted by society are transferred and transformed into a variety of natural processes to manifest themselves in changes in environmental conditions.
- *Environmental status indicators*; give a qualitative and quantitative description of natural phenomena (e.g. temperature), biological phenomena (e.g. fish stocks) and chemical phenomena (e.g. CO_2 concentration in the atmosphere) in a specific area.
- *Environmental Impact Indicators*; describe changes in the conditions listed above. These changes affect the functions of the environment, such as human health and ecosystems, resource availability and biodiversity loss.
- *Indicators of social response*; refer to the response of groups and individuals in society, as well as government efforts to prevent, compensate, improve or adapt to changes in the state of the environment.

In this framework, unlike PSR, the interdependencies that emerge can be characterized as negative or positive. In addition, the indicators proposed in this context can be divided into five broad conceptual categories, each of which can correspond to one or more of the five components of the framework, as discussed above. Regardless of which component an indicator belongs to, it should be able to deliver and convey a clear message.

Themes and Subthemes

Creating a conceptual framework for indicators aims in identifying what to measure, what are the expectations out of these measurements and ultimately what indicators should be used to achieve this. Different frameworks have been proposed, developed, and applied through the years trying to highlight the interrelation between the different dimensions inherent in the examined system. Their differences lie in the fact that they use different approaches in perceiving the various dimensions and in grouping the issues to be measured[16]. Moreover, frameworks were developed aiming to facilitate the sustainability assessment and to assist policy makers in the non-biased selection of indicators[17].

Theme- or issue-based frameworks have been widely used. By grouping indicators into different but interrelated categories, these frameworks follow a thematic hierarchical approach. In such frameworks, themes or issues are usually indicated by their policy relevance. What is notable about these frameworks is that they allow a clear and direct link to policies, targets, and goals for both the policy makers and the public[16]. A thematic framework reflects a hierarchical approach where issues and priorities are organized in themes and subthemes[18]. In 2001, the United Nations Department of Economic and Social Affairs

[16] UNDESA, 2007. Indicators of Sustainable Development: Guidelines and Methodologies. October 2007, Third Edition. ISBN 978-92-1-104577-2.
[17] Gudmundsson, H., 2003. The policy use of environmental indicators—learning from evaluation research. The Journal of Transdisciplinary Environmental Studies 2, 1–11.
[18] Bayo, Manuel & Mirón, I., (2006). A flexible framework for regional sustainable development indicators using system thinking criteria (INSURE).

have adopted the thematic framework approach for the selection of sustainable development indicators, an approach that was evolved from the Driving Force-State-Response (DSR) previously used by the organization[19]. Such a thematic oriented framework and hierarchical approach was also adopted by the European Commission in 2005 to select and organize its Sustainable Development Indicators (SDIs)[20].

More specifically, such hierarchical theme-based frameworks are structured in various levels, with the first level to include more generic dimensions[21]. Following, the intermediate levels of this hierarchical framework represent independent elements that might be either explicitly or implicitly linked to certain objectives[22]. In brief, generic dimensions are divided into themes that are further divided into sub-themes. Themes can be linked to desired goals and sub-themes to desired objectives to be reached or addressed[21]. Each of the sub-themes used can hold one or more indicators that through different ways address the sub-theme[23].

The flexibility of such a framework is what makes it so popular both for environmental and sustainability assessments, thus being one of the dominant frameworks in literature along with the Pressure-State-Response (PSR) framework. Finally, a differentiation in referencing themes and sub-themes can be observed among the literature coming across with the terms of impact "categories" and "sub-categories", "principles and criteria" or "components"[21].

City Region Food System (CRFS) indicator framework

The City Region Food System (CRFS) [24] indicator framework was developed by Food and Agriculture Organization (FAO) and Resource centre on Urban Agriculture and Food Security (RUAF) Foundation, as part of the City Region Food Systems (CRFS) toolkit, to assess and plan sustainable city region food systems. The CRFS indicator framework is a practical assessment and planning tool designed to help cities to:

i. Assess the current status and performance of a city region food system following a whole-system approach
ii. Identify priority areas for action with clear desired outcomes and ways of measuring change
iii. Help with planning strategy and action to achieving the desired outcomes
iv. Establish baselines and monitor changes resulting from (future) policy and programme implementation.

The CRFS framework targets those undertaking food system analyses of sustainability and planning for future resilience at a city, and city region, level by adopting a "whole food system" approach to connect

[19] United Nations (UN), Indicators of Sustainable Development: Guidelines and Methodologies, Second Edition, UN Sales Publication No.E.01.II.A.6 (New York, September 2001).
[20] European Commission, 2005 (EC, 2005). Measuring progress towards a more sustainable Europe. Sustainable Development indicators for the European Union
[21] Gasso, V., Oudshoorn, F.W., de Olde, E., Sorensen, C.A.G., 2015. Generic sustainability assessment themes and the role of context: The case of Danish maize for German biogas. Ecol. Indic. 49, 143–153.
[22] FAO, 2013. Sustainability Assessment of Food and Agriculture Systems: Guidelines, Version 3.0. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/SAFA_Guidelines_Version_3.0.pdf.
[23] Olsson, Johanna Alkan, Bockstaller, Christian, Stapleton, Lee M, Ewert, Frank and et al, (2009) A goal oriented indicator framework to support integrated assessment of new policies for agri-environmental systems. Environmental Science and Policy, 12 (5). pp. 562-572. ISSN 1462-9011
[24] Carey J., Dubbeling M. (2017), City Region Food SystemIndicator Framework – City Region Food System ToolkitAssessing and planning sustainable city region food systems, developed by FAO, RUAF Foundation and Wilfrid Laurier University

policy priorities to outcomes. Taking a "whole food system" approach, the indicators are based on a matrix of food system dimensions:

- those sustainability areas that reflect the multifunctional nature of the food system; and
- food system outcomes for the different components of the whole food system (from production through to waste, and also food system policy and planning).

In this context, the food system is broken down into six components, which are the following:

- Input supply and food production
- Food storage, processing and manufacturing
- Food wholesale and distribution, Food marketing, catering and retail
- Food consumption
- Food and organic waste management
- (Cross cutting): City region food system policy planning

In total, 210 indicators are included in the CRFS framework. The proposed indicators are organised under six sustainability areas, which are further organised into 9 objectives, 21 desired outcomes and 29 impact areas. In more detail[24]:

- ***Overarching objectives:*** *For each of the sustainability areas, there is one or more overarching objective that relates to different components of the food system. These might connect to policy priorities for cities or rural areas.*
- ***Outcomes:*** *Outcomes or 'desired direction of travel' are the types of changes that cities may want to see in the future, i.e. changes that characterise a more resilient and sustainable city region food system. These might connect to interventions or development programmes or practical initiatives led by municipalities or NGO's or businesses or multi-stakeholder partnerships.*
- ***Impact areas:*** *The impact areas are more specific types of changes that could be measured in various ways. It is important to clarify the focus of the assessment; the city may need to select from these impact area suggestions as appropriate. These might feature in research or in monitoring and evaluation strategies of development programmes.*

Milan Urban Food Policy Pact (MUFPP) monitoring framework

The Milan Urban Food Policy Pact (MUFPP) Monitoring Framework[25] has been conceived to serve as a key tool to complement the implementation of the SDGs at local level. It was developed by the Municipality of Milan, FAO and RUAF Foundation with input from a number of cities.The purpose of the Monitoring Framework is to:

i. Serve as an instrument for cities & urban food stakeholders to identify food-related policy and programme priorities.
ii. Illustrate to what extent "desired changes" are happening and/or how impactful such changes are.
iii. Evaluate gaps in policy advancement and resource mobilization as well as reveal overall urban food systems improvement.

[25] Milan Urban Food Policy Pact (MUFFP), Monitoring framework indicators, Available at: http://www.milanurbanfoodpolicypact.org/milan-urban-food-policy-pact-monitoring-framework/

iv. Help design inclusive and resilient national food policies that make our cities and connected rural-areas places of "good and equitable living.

The MUFPP monitoring framework targets primarily municipal governments, development professionals and food practitioners working on urban food-related projects programmes. The MUFPP monitoring framework adopts a city food system approach to connect policy priorities to outcomes. *"Designed by cities for cities"*, the monitoring framework is non-binding and aims at serving as a practical guidance for cities on how to measure the impact of their sustainable food policy processes and initiatives.

In total, 44 indicators are included in the monitoring framework and are organised under 6 work streams and 27 outcome areas. The six work streams set out by the MUFFP monitoring framework are the following:

i. Governance (ensuring an enabling environment for effective action)
ii. Sustainable diets and nutrition
iii. Social and economic equity
iv. Food production (including urban-rural linkages)
v. Food supply and distribution
vi. Food waste

As mentioned in the monitoring framework, *"Outcome areas (or "desired direction of travel") are the changes that cities want to see in the future: i.e. changes that characterize a more resilient and sustainable food system"*. The 27 outcome areas can be further grouped into four broader impact areas and development objectives, which are the following:

- (Improved) Citizen engagement and accountability in policy making
- (Improved) Health, Nutrition and Food Security
- (Reduced) Poverty and (Improved) Economic Growth and Equity
- (Reduced) Environmental Impact and Footprint

Finally, the proposed indicators are accompanied by 37 voluntary actions which are related to the outcome areas. The actions are built upon the experience of the cities involved in the Pact and *"serve as an example of options that cities and food actors posses in order to meet the desired outcomes"*.

Sustainability Assessment of Food and Agriculture systems (SAFA)

The Sustainability Assessment of Food and Agriculture systems framework (SAFA)[26] is a holistic global framework for the assessment of sustainability across food and agriculture value chains. By providing a transparent and aggregated framework for assessing sustainability, SAFA seeks to:

i. Harmonize sustainability approaches within the food value chain, as well as furthering good practices.
ii. Provide a clear understanding of the constituent components of sustainability to enterprises, whether companies or small-scale producers, involved with the production, processing, distribution and marketing of goods.

[26] Scialabba, Nadia & Grenz, Jan & Henderson, Elisabeth & Nemes, Noemi & Sligh, Michael & Stansfield, John & Lee, Sally & Brugère, Cecile & Bentacur, Marta & Kneeland, Doug & Larrea, Cristina & Bianchi, Gabriella. (2013). Sustainability Assessment of Food and Agriculture systems (SAFA) Indicators.

The SAFA framework targets food and agriculture enterprises (individual or associations in the crop, livestock, fisheries, aquaculture and forestry sub-sectors), Non-Governmental Organizations (NGOs) and sustainability standards and tools community, Governments, investors and policy-makers. The SAFA framework aims at the evaluation of enterprises, rather than a product, through a supply chain scope, which means that it is applicable to all entities in supply chains but does not include consumers. In this context, the framework breaks down the supply chain into the following six entities[26]:

- Input's suppliers
- Primary production
- Processing
- Delivery
- Wholesaling
- Retailing

Furthermore, SAFA is organised under four pillars which recognises as the four dimensions of sustainability, i.e. good governance, environmental integrity, economic resilience and social well-being. Although the concept of sustainability, which is widely accepted, encompasses three dimensions, these of envirnment, economy, and society, nowadays the concept of "governance" has started to gain some ground as the fourth dimension of sustainability. This being said, SAFA aims at serving as a guidance document for assessing the synergies and trade-offs between the four dimensions of sustainability. This is achieved through developing a framework of themes and sub-themes, which correspond to goals and objectives respectively. In particular, for the four sustainability pillars mentioned, a total of 116 default indicators is organised under 21 Themes, which refer to universal sustainability goals, and 58 Sub-themes, which refer to sustainability objectives specific to supply chains.

Finally, the SAFA framework aims to establish a common language when it comes to the sustainability assessment of enterprises in food and agriculture sector. Building upon existing sustainability tools, standards and certification approaches, SAFA sets the perspective of a "*harmonized taxonomy under one framework ensuring consistency, applicability and transparency*" and an "*overarching common sustainability language"*.

SUStainable Food And Nutrition Security (SUSFANS) project framework

One of the main objectives of the SUSFANS[27] project is to develop a set of concepts and tools to help policy and decision makers across Europe make sense of the outcomes and trends of the EU food system. The SUSFANS conceptual framework aims to serve multiple purposes. The most important is to visualize and document the project's understanding of the different components and actors of the EU food system and their interactions which are ultimately shaping the system and the outcomes it provides. Having created a coherent, logical structure describing the EU food system allows for a detailed analysis of the system and an assessment of its status.

[27] Zurek M., Ingram J., Zimmermann A., Garrone M., Rutten M., Tetens I., Leip A., van 't Veer P., Verain M., Bouwman E., Marette S., Chang C., Latka C., Hornborg S., Ziegler F., Vervoort J., Achterbosch T., Havlik P., Terluin I., Achterbosch T., Deppermann A., (2016), Deliverable 1.1: A Framework for Assessing and Devising Policy for Sustainable Food and Nutrition Security in EU: The SUSFANS conceptual framework, (SUSFANS project)

The SUSFANS conceptual framework highlights the dynamic aspects of the system to help understand what drives the system and lays out the interactions and feedback mechanisms across it. To this end it aims to be:

- Descriptive, in that it describes the different food systems components and the basic pathways towards achieving the four EU policy goals.
- Precise, in using the terms and terminology defined by the project therefore also lays out the glossary of terms used within the project. It thus also specifies which variables, aggregate indicators and metrics the project needs to develop to evaluate systems performance.
- Decision oriented, and geared towards providing support for decision makers thinking through options for better achieving and balancing across the four EU policy goals. It thus shows entry points for system change and the roles of different actors in achieving the stated goals.
- Applicable at multiple levels, in that its basic setup represents the main food system components at the EU, member state and local level. Thus, who, for example, the different actors are at each scale, or what drives their choices in specific, might vary, but in terms of analysing and representing the components of the system, the SUSFANS conceptual framework aims to capture the key components present at each geographical scale.

The project proposes a set of metrics for assessing the performance of the EU food system in delivering sustainable food and nutrition security.[28] The performance assessment is structured around for key policy goals with regard to the European food system, which are presented below:

i. A balanced and sufficient diet to EU citizens;
ii. Reduced environmental impacts;
iii. Competitive agri-businesses;
iv. Equitable conditions and outcomes of the EU food system.

The project decided to take a hierarchical approach to aggregating from Individual Variables to Derived Variables to Aggregate Indicators to Performance Metrics. This approach aims at marrying the notion that decision makers want only a small but powerful set of metrics to communicate the findings of the assessment, with the need to substantiate these metrics with the best available data from a large number of sources in a transparent way. Thus, the team selected between three to four performance metrics for each policy goal;

The hierarchical approach aims at marrying the notion that decision makers want only a small but powerful set of metrics to communicate the findings of the assessment.

Conclusions

Six indicator frameworks were analysed above, two generic and overarching indicator frameworks and four food system scpecific indicator frameworks. Regarding the two overarching frameworks, it can be said that the DPSIR framework is a more complex one than the Themes-subthemes. While the later follows a more hierarchical approach on developing indicators, the DPSIR indicator framework tries to highlight all the possible interconnections between its five components. Although the DPSIR framework

[28] Zurek M., Leip A., Kuijsten A., Wijnands J., Terluin I., Shutes L., Hebinck A., Zimmermann A., Götz C., Hornborg S., van Zanten H., Ziegler F., Havlik P., Garrone M., Geleijnse M., Kuiper M., Turrini A., Dofkova M., Trolle E., Mistura L., Dubuisson C., van 't Veer P., Achterbosch T., Cuaresma J.C., Ingram J., (2017), Deliverable 1.3: Sustainability metrics for the EU food system: a review across economic, environmental and social considerations, Metrics, Models and Foresight for European SUStainable Food And Nutrition Security (SUSFANS project)

can bring to light various and interesting interrelations when implemented, its comlexity makes it difficult to manage especially when applying it for the comparison of varying systems. On the other hand, the Themes-subthemes indicator framework can be less complex and more straightforward to interpret. However, hidden linkages and indirect relations between the various elements is more difficult to be underlined and shown using this framework.

Regarding the four food system specific indicator frameworks studied, it is concluded that both similarities and differences were observed. To facilitate the comparison, four domains of interest with respect to Task 3.1 were identified, which are the following:

- **Target audience**; This domain refers to the groups that could potentially use and be interested in the specific indicator framework.
- **Food system components**; This domain refers to the constituent elements of a food system that are identified in the specific indicator framework.
- **Impact areas**; This domain refers to the identified impact areas that are linked to the food system components in the specific indicator framework.
- **Integration**; This domain refers to the approach used to link the food system components to the identified impact areas in the specific indicator framework.

Based on these four domains and the analysis previously conducted for the four food system specific indicator frameworks, a comparative overview of the key characteristics of these frameworks was prepared and is presented in Table 10.1. This comparative overview along with the extended litearature review conducted served as a guideline for exploring the most suitable approach in framing the FoodSHIFT2030 indicators. By focusing on these four domains it was made easier to analyse each framework's characteristics and examine whether or not they could fit in the FoodSHIFT2030 project context and the needs of Task 3.1.

One of the key similarities observed in all four indicator frameworks was the integration approach followed for linking the food system components with impact areas. In practice, all four frameworks followed an hierarhical approach as the one seen in the theme-subtheme indicator framework. However, not all the examined frameworks had the same number of interim steps in their hierachical model. A second similarity observed was the target audience of these frameworks. All of the studied food specific indicator frameworks are addressed to regional/local authorities, governments, planning professionals and policy makers, with the SAFA framework focusing also on enterprises to a greater extent than the other three.

The key and main difference observed between the examined indicator frameworks was more the typology used to describe the various food systems components and impact areas, rather than the content of this domains. Of course differentiation was also obseved in the content but not that significant in its core. In addition to this, a second difference observed refers to the perception and definition of a food system and its components. In particular, the each frameowrk identifies different stages as part of the food system, following sometimes a more holisitc approach as in the case of the SUSFANS project and other times a more supply chain focused approach as in the case of the SAFA indicator framework. This requires carefull study of such frameworks in order to reassure that all the desired components are included and addressed.

Indicators' framework	Target audience	Food system components	Impact areas	Integration

CRFS	For those undertaking food system analyses of sustainability and planning for future resilience at a city and city region level	Supply chain, consumption, waste management, CRFS policy planning	Sustainability areas	Overarching objectives Outcomes Impact areas
MUFPP	Municipal governments, development professionals and food practitioners	N/A	Impact areas	Outcome areas Recommended actions
SAFA	Food and agriculture enterprises, NGOs, Governments, investors and policy-makers	Supply chain entities: Input's suppliers, Primary production, Processing, Delivery, Wholesaling, Retailing	Sustainability dimensions	Themes Sub-themes
SUSFANS	Food system policy & decision makers (EU institutions, national level)	EU Food system components: Actors, Drivers of change, Outcomes of the EU food system, Activities, Goals at EU level	EU Policy goals	Policy goals Performance metrics

Table 10.1. Summary of the main characteristics of indicator frameworks relevant to the FS2030 project

ANNEX II: Creation of an indicators' inventory

The main scope behind the creation of an indicator inventory, focusing primarily on the FoodSHIFT2030 project agenda, is to create an open-source, broad and coherent database, which will allow the interested parties to:

- identify the focus areas of indicator sets proposed in various policy and policy relevant documents relating to FoodSHIFT2030 project themes,
- identify and highlight not only the overlapping but also the complementarity between the proposed sets of indicators for the different documents,
- act as a starting point for building new sets of indicators adjusted to a project's unique needs, aims and objectives.

In this paragraph, the results of the literature review, focusing primarily on policy and policy relevant documents concerning food systems, are presented. The desired outcome was to identify the documents providing methodologies and sets of indicators for monitoring the performance and impacts of food systems aiming the attention at Food & Nutrition Security, Food Sovereignty, and Food System Sustainability.

Furthermore, it is evident that a holistic approach should be adopted for measuring the performance and impacts of food systems. A holistic approach takes into account all the components and elements of a system as well as their relationships and related effects[29]. According to Garnett et al.[30] social, economic and biophysical interactions are multidisciplinary encompassed in food system dynamics, which refer to interconnection between food, resource efficiency, governance, people, climate, etc. To this end a systemic approach should be followed when choosing specific indicators.

It is not in the aim of this study to give an extensive literature review of the existing documents concerning these thematic areas. For this reason, only a brief presentation of the reviewed documents follows with emphasis to be given in the selected documents valorized further in this study. Nevertheless, it is in the aim of this study to propose a pool of indicators following a systemic approach thus identifying and recognizing all the components of a food system, e.g. resource efficiency, human health and wellbeing, food waste, circularity, governance, food availability & accessibility, preserving the environment, job creation, etc. As a result, an extensive multidimensional literure review was inevitable.

To begin with, the FoodSHIFT2030 project takes departure in the EU Food 2030 Research and Innovation Policy Framework, the EU's commitment under the Paris Agreement and the UN Sustainable Development Goals to launch an ambitious citizen-driven transition of the European food system towards a low carbon circular future, including a shift to less meat and more plant based diets. Having this as a starting point an extensive literature review was conducted among 34 sources of information. These sources included 26 policy and policy relevant documents, 3 on-line indicator datasets, 2 Indexes and 3 EU funded projects.

Reviewed Documents	Organization	Type
2030 Agenda for Sustainable Development	UN	Document

[29] FAO, Sustainable Food Systems, Concept and framework (2018)
[30] Garnett, T., Benton, T., Nicholson, W., & Finch, J. (2016). Overview of food system challenges (Foodsource: chapters). Food Climate Research Network, University of Oxford.

Common Agriculture Policy	EC	Document
The six pillars of food sovereignty	Nyéléni	Document
G7 Declaration for Food Security and Nutrition	G7	Document
Common Fisheries Policy	EC	Document
EC Bioeconomy Strategy	EC	Document
Special Report on Climate Change and Land	IPCC	Document
Strategic Innovation and Research Agenda	EC/BBI	Document
Research for AGRI Committee-Urban and Peri-urban Agriculture in the EU	EC	Document
Paris Agreement	UN/UNFCCC	Document
4th SCAR Foresight Exercise	EC	Document
The European Green Deal	EC	Document
WFP Strategic Plan (2017-2021)	WFP	Document
Milan Urban Food Policy Pact		Document
EC FOOD 2030 Independent Expert Group	EC	Document
City-Region Food System (CRFS)	FAO & RUAF	Document
EC Staff Working Document SWD (2016) 319	EC	Document
Sustainability Assessment of Food and Agriculture systems (SAFA)	FAO	Document
Indicators for a Sustainable Food System	Defra UK	Dodument
A policy framework for climate and energy in the period from 2020 to 2030 COM/2014/015 final	EC	Document
European Research & Innovation for Food & Nutrition Security	EC	Document
FOOD SECURITY AND SOVEREIGNTY (BASE DOCUMENT FOR DISCUSSION)	FAO	Document
Towards a Common Food Policy for the European Union	IPES-Food panel	Document
Global Strategic Framework for Food Security and Nutrition (GSF)	CFS	Document
Digest of EEA indicators 2014	EEA	Document
The European environment —state and outlook 2020	EEA	Document
Faostat - Food Security and Food System Indicators	FAO	Dataset
Eurostat - SDGs monitoring	EC	Dataset
Indicators	World Bank	Dataset
Food Sustainability Index	BCFN & EIU	Index
Global Food Security Index	EIU	Index
SUSFANS		Project
INDDEX		Project
FOODMETERS		Project

Table 10.2. Overview of the reviewed sources

Out of all these sources that have been reviewed, only eleven (11) were selected to be further analysed and be included in the inventory of indicators. Firstly, not all of these sources propose methodologies and sets of indicators to monitor the performance and the impacts of food systems. Secondly, even the ones that do provide sets of indicators were in some cases either too generic or have resulted from the synthesis of the selected ones or addressed one specific thematic area.

It is once again noted that it was this study's objective to attempt a holistic approach in creating a pool of indicators and too generic or too specific could not serve this cause. Consequently, 7 documents, 2

datasets and 2 indexes were selected to be analysed and utilized. In more detail, the 2030 Agenda for the Sustainable Development was selected as it is a fundamental policy document with every other referring to it ever since it was adopted. Additionally, it provides a huge set of indicators setting key guidelines for monitoring efforts towards achieving the SDGs. Moving on, the Milan Urban Food Policy Pact was selected as it is the first international protocol bringing together cities committed to developing sustainable food systems. Moreover, the MUFPP provides a comprehensive city-region scale monitoring framework consisting of 44 performance indicators organized in 6 categories. Two of the selected sources, 1 document and 1 dataset, are under the authority of the European Commission. Firstly, the FOOD 2030 Independent Expert Group report was selected as it sets a new approach by targeting in a climate-smart and sustainable food system. Another key fact about this document is that it covers the whole supply chain from food production to waste streams. Here a large set of indicators is also proposed organized under 3 Missions. Secondly, the Eurostat's dataset concerning Europe's monitoring framework towards achieving the SDGs was also selected mainly as an attempt to identify convergences and divergences with the UN SDGs. One of the most holistic framework regarding the food systems, the City-Region Food System (CRFS) was also selected to be included in the inventory. As mentioned, *"the indicator framework connects policy priorities to outcomes that cities may want to see in the future and defines possible indicators for each outcome"*[24].

Getting on to the rest of the selected sources, 1 document and 1 dataset are under the authority of FAO. The first to be selected was the SAFA framework as it addresses the sustainability of food systems in a detailed and holistic approach. The selected FAO's dataset includes indicators concerning the food security pillars and more generic indicators to allow comparison between different regions. Therefore, they were selected with the intention to act complementary to each other. At this point both the two indexes reviewed was selected to be included in the inventory, namely the Food Sustainability Index (FSI), developed by the Barilla Center for Food & Nutrition (BCFN) and the Economist Intelligence Unit (EIU), and the Global Food Security Index (GFSI), developed by the EIU. The FSI index was selected as it proposes a different approach in organising indicators than the one developed in the SAFA framework. The GFSI index was selected as it considers the issues of food affordability, availability, quality and safety, and natural resources and resilience, focusing on measuring the drivers of food security across both developing and developed countries. Last but not least, the Defra's UK indicator framework was selected to be included in the inventory. This document was selected as it reflects a structured effort of setting a monitoring framework at national level.

As a result, a detailed inventory of proposed indicators was created based on the selected policy and policy relevant documents. For the setup of this inventory the spreadsheet program MS-Excel was used, as it allows organizing and handling big data sets and large sources of information. For the vast majority of the selected documents, the inventory was completed manually. At this point of the study, only the indicators' names are included in the inventory with no further details such as detailed definition, data requirements, measurement unit etc. Finally, to serve the purposes of Task 3.1, an inventory with eleven (11) indicator sheets was created, that is open to and accessible by all project partners. Each one of the inventory sheets corresponds to a policy or policy relevant document and includes the respective to the document indicators. In total, for the eleven (11) completed indicator sheets, 1114 indicators were recorded and organized in the inventory. A detailed presentation concerning the documents and the number of indicators is provided in Table 10.3.

Organization	Source	Number of recorded Indicators
EC	EC FOOD 2030**Error! Bookmark not defined.**	75

	EU SDGs[31]	100
FAO	Europe[32]	52
	Food Security[33]	44
	SAFA[26]	116
Municipality of Milan, FAO, RUAF	Monitoring Framework[25]	44
UN	SDG Agenda[34]	244
EIU	Global Food Security Index (GFSI)[35]	68
EIU & BCFN	The Food Sustainability Index (FSI)[36]	108
Defra UK	Indicators for a Sustainable Food System[37]	53
RUAF & FAO	City Region Food System (CRFS)[24]	210
TOTAL	-	**1114**

Table 10.3. Summary of source and number of indicators recorded in the Task 3.1 inventory

[31] Eurostat, Sustainable Development Indicators, Available at: https://ec.europa.eu/eurostat/web/sdi/no-poverty
[32] FAOSTAT, Selected Indicators, Available at: http://www.fao.org/faostat/en/#country
[33] FAO – Statistics, Food Security Indicators, Available at: http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.XmtOY3KxXb0
[34] UN General Assembly (2015), Transforming our world : the 2030 Agenda for Sustainable Development, 21 October 2015
[35] EIU, Global Food Security Index, Available at: https://foodsecurityindex.eiu.com/
[36] Barilla/EIU (2018). Food Sustainability Index, the Economist Intelligence Unit and the Barilla Center for Food & Nutrition Foundation
[37] Defra (2009), Indicators for a Sustainable Food System, Available at: https://webarchive.nationalarchives.gov.uk/20130125171715/http://www.defra.gov.uk/statistics/files/defra-stats-foodsystemindicators.pdf

ANNEX III: Understanding the FAL DNA

Understanding the FAL DNA was essential in the process of creating the list of indicators for each FAL. For this reason, a number of tools was used which included the close interaction which all Subtask leaders and the FALs representatives. These tools included interviews, discussions, and even workshop exercises.

First level understanding

In this section, the results are presented per question and according to the order these were included in the questionnaire distributed in the nine FALs. As the interviews were made in the initial stage before the FALs formulate their final character, the answers were updated before the final selection of the indicators during the one to one interviews.

Mission

This was the first question the FALs had to answer. This question aimed at outlining the mission of the FAL and it was requested to be kept as short and FAL representative as possible. The idea was through 2-3 lines to present the essence and core concept of the FAL. The scope of this question was to track changes, if any, in the mission of the FALs to the ones stated in the DoA.

For this, the question posed to the FALs was the following:

Q1. The mission of your LAB in the context of FoodSHIFT2030 project.

i.e. the organization's reason for existence[2]

FAL	Mission
ATH	Schools as sites of food experience and food system transformation
AVG	Public procurement as a driver for a more regional, sustainable and healthy food system
BCN	Understanding Fab Labs as sites to create, accelerate, link communities to, and build capacity in food tech.
BER	Food system transformation through an innovation hub for sustainable regional food supply based on a decentralization concept for food distribution and education
BRI	Sustainable land use and food chain strategies for young entrepreneurs building on social innovation in food systems
BRV	Integrating traditional and local producers into an innovative and ambitious regional food system
CPH	To strengthen the regional food system by creating awareness, recognition and learning about food system transition based on selected innovation actions.

OST	Develop a food strategy for the city, in which the newly developed agricultural park Gardens of Stene are the engine for stimulating the local food dynamics
WRO	Strengthening of innovation potential of local sustainable food system – "Accessible Food Gardens"

Table 10.4. Mission of each of the 9 FALs

The outcomes in this first question were very interesting. Some of the FALs (e.g. Athens, Wroclaw) have kept their initial mission unchanged, while others have enriched their initially stated mission. It should be noted that the changes observed where in line with the initially stated mission presented in the DoA, however they now appeared to be more concrete and defined.

Target groups

This was the second question the FALs had to answer. This question aimed at outlining the main target groups of the FALs activities and outcomes. The idea was to briefly map the various target groups of the nine FALs to gain better insight on their profile. The scope of this question was to better understand the aim of the FALs actions through the target audience the FALs focus on. For this, they were asked to score from 0 to 5 the groups that are targeted by their FAL. The scoring helped in understanding in more detail the nature of the FALs concept and activity, since the di fferent target groups are not of the same level of interst for each FAL. Moreover, FALs were free to add any target group they considered appropriate and was not included in the ones already present in the questionnaire. However, it was not asked to link each of their planned actions to specific target groups.

For this, the question posed to the FALs was the following:

Q2. Which are the main target groups of your LAB?

i.e. score out of 5, Please feel free to add other target groups not mentioned here

The results are presented separately for each FAL.

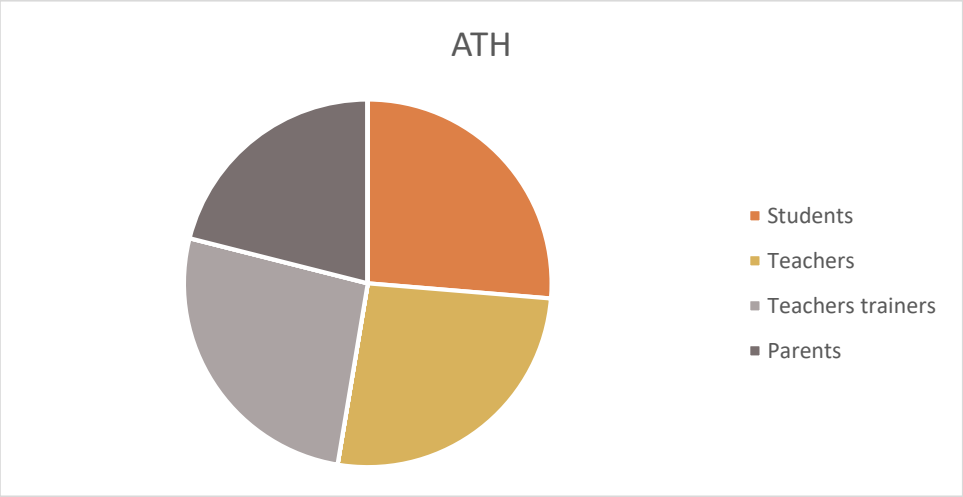


Figure 10.1. Target groups of the Athens FAL

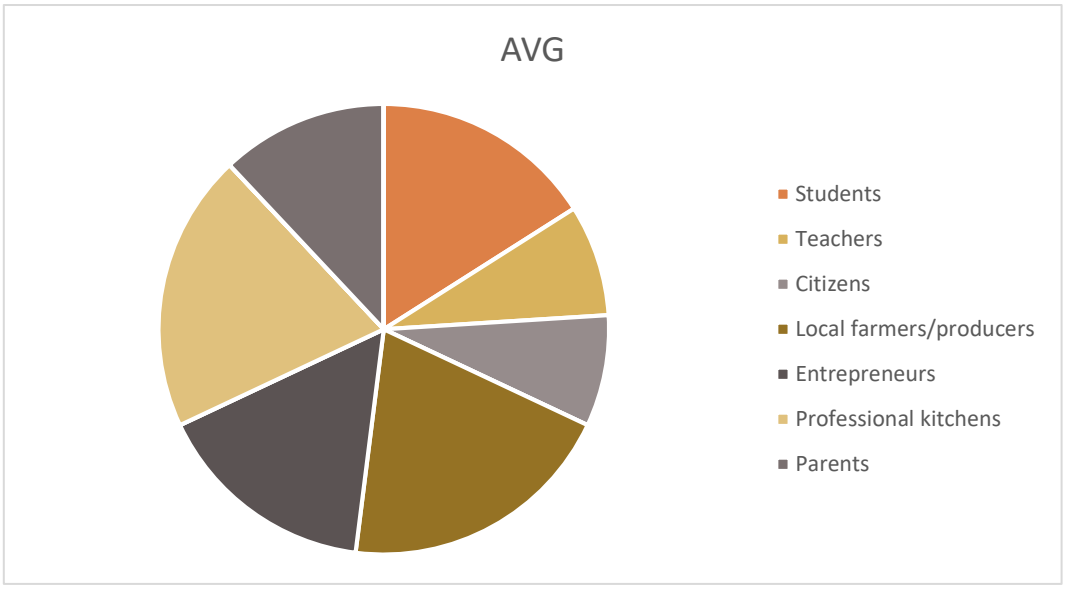


Figure 10.2. Target groups of the Avignon FAL

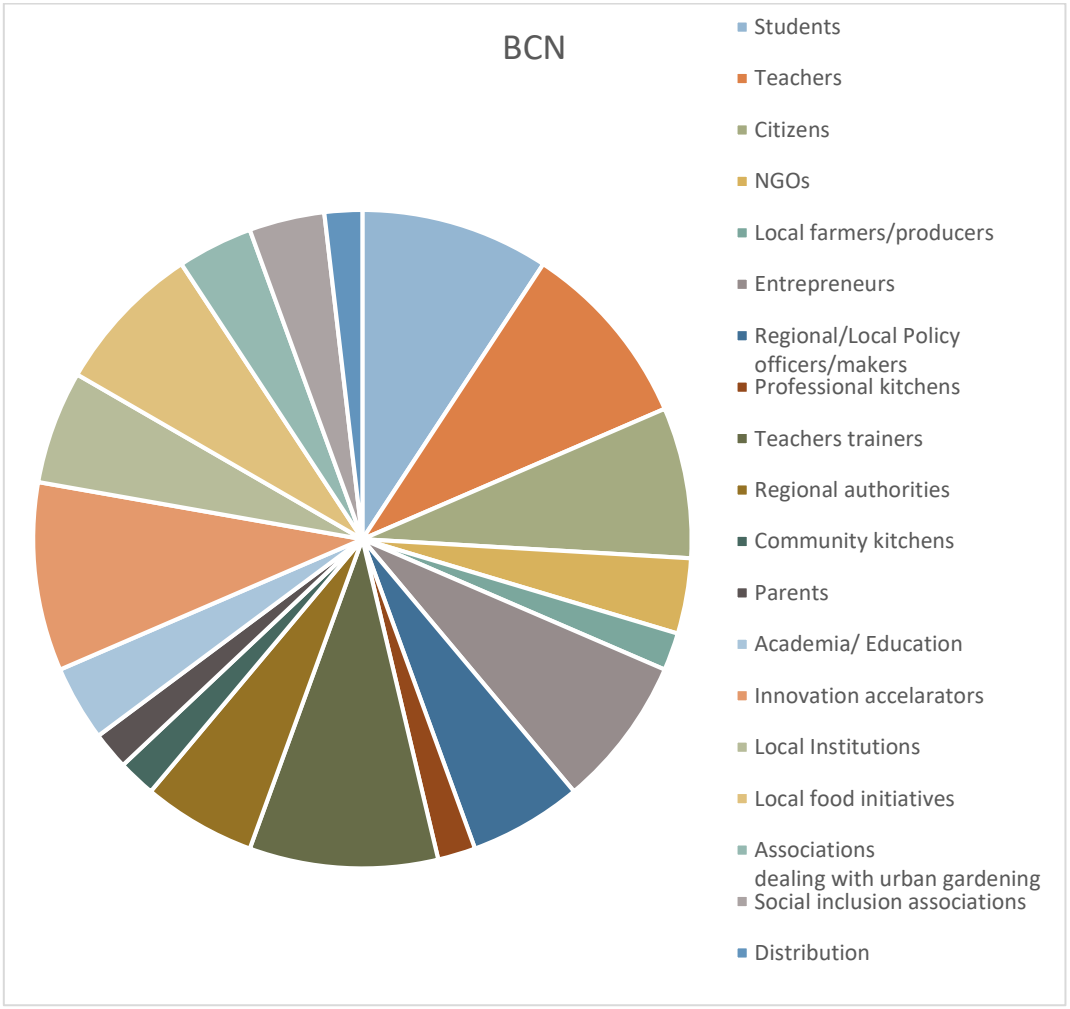


Figure 10.3. Target groups of the Barcelona FAL

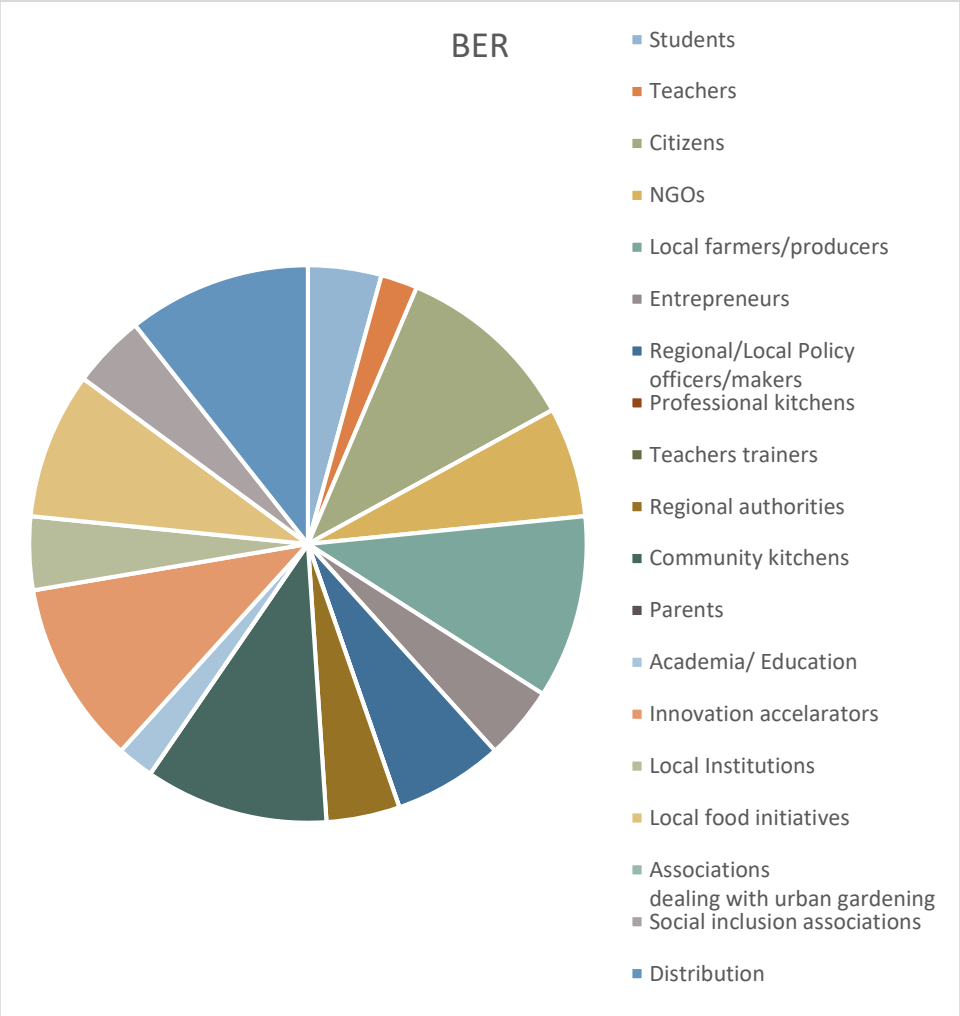


Figure 10.4. Target groups of the Berlin FAL

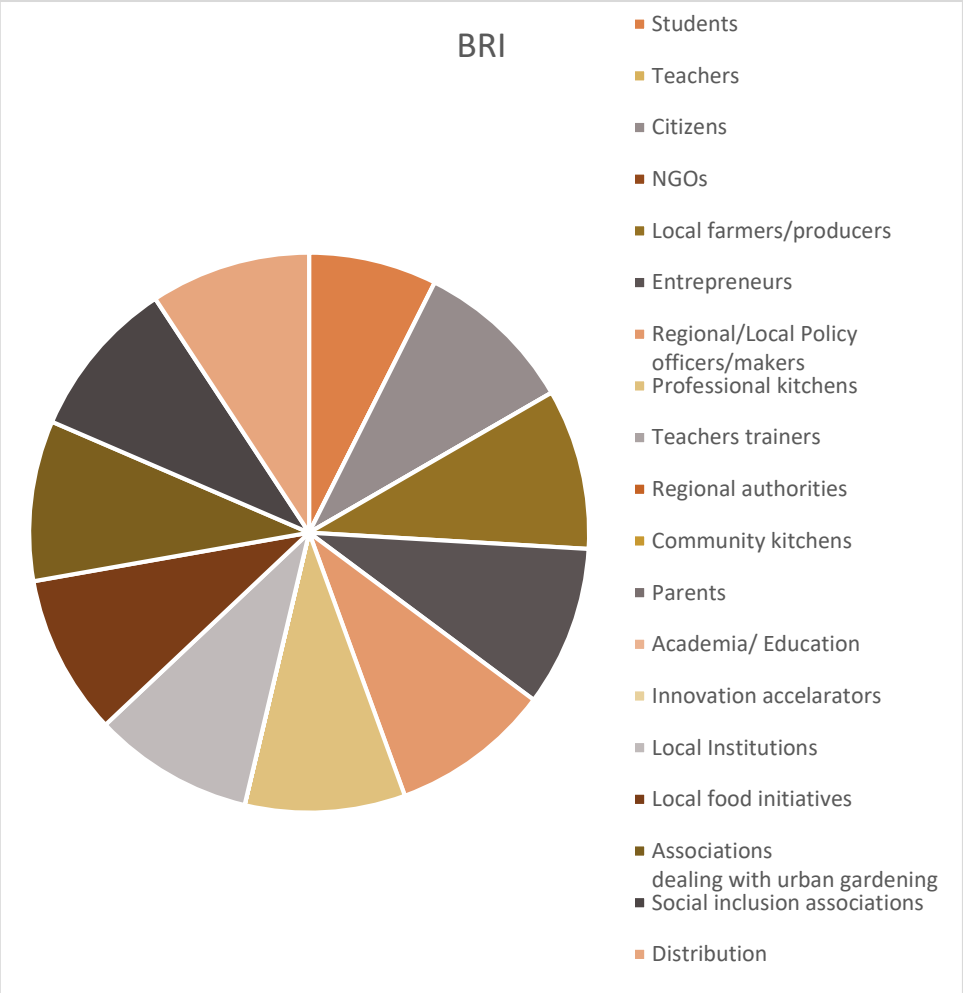


Figure 10.5. Target groups of the Bari FAL

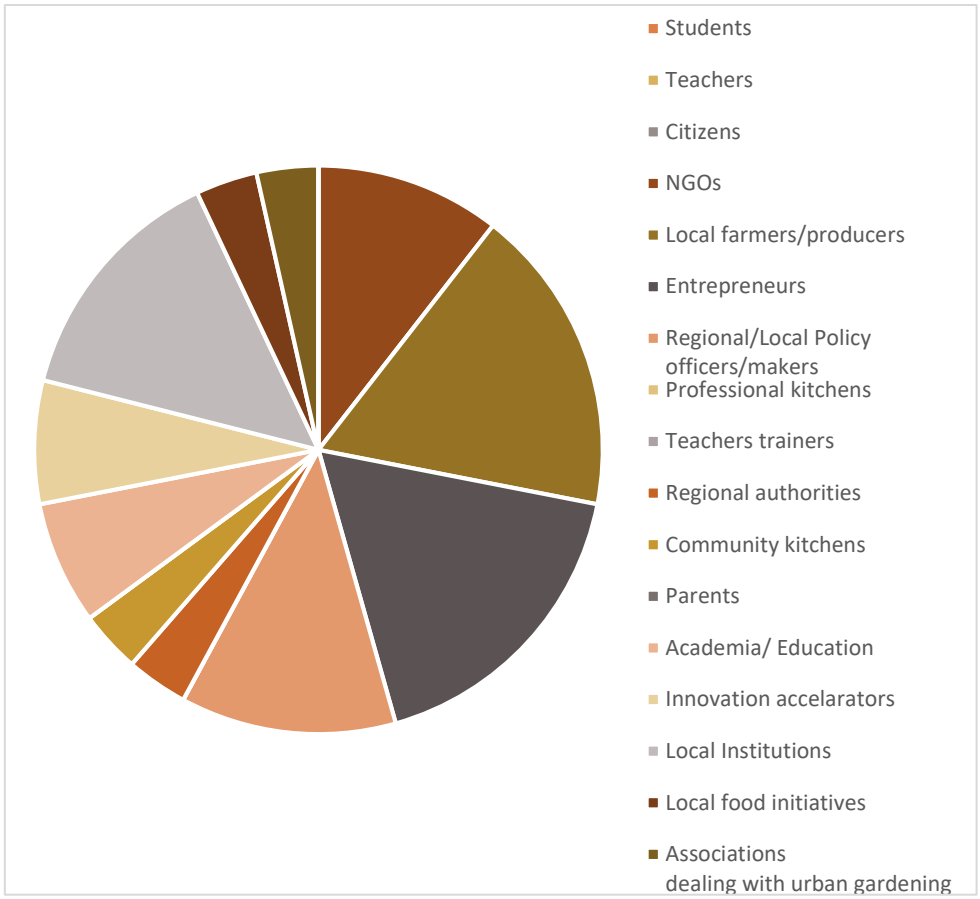


Figure 10.6. Target groups of the Brasov FAL

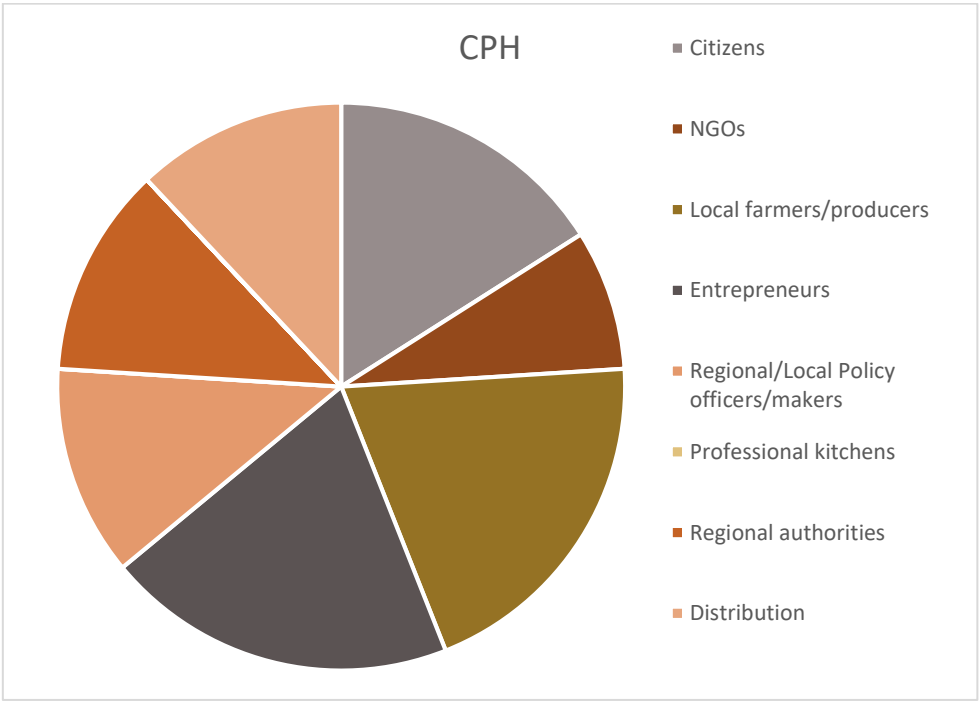


Figure 10.7. Target groups of the Copenhagen FAL

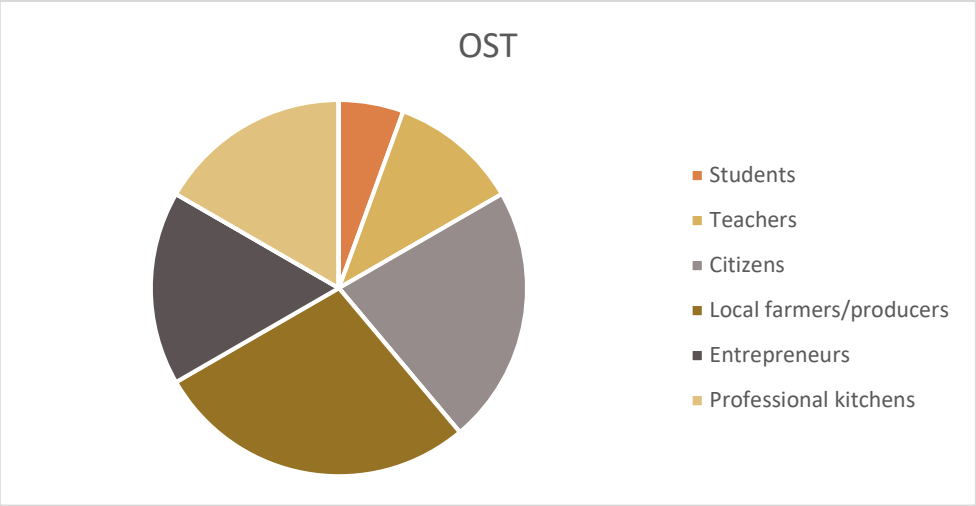


Figure 10.8. Target groups of the Ostend FAL

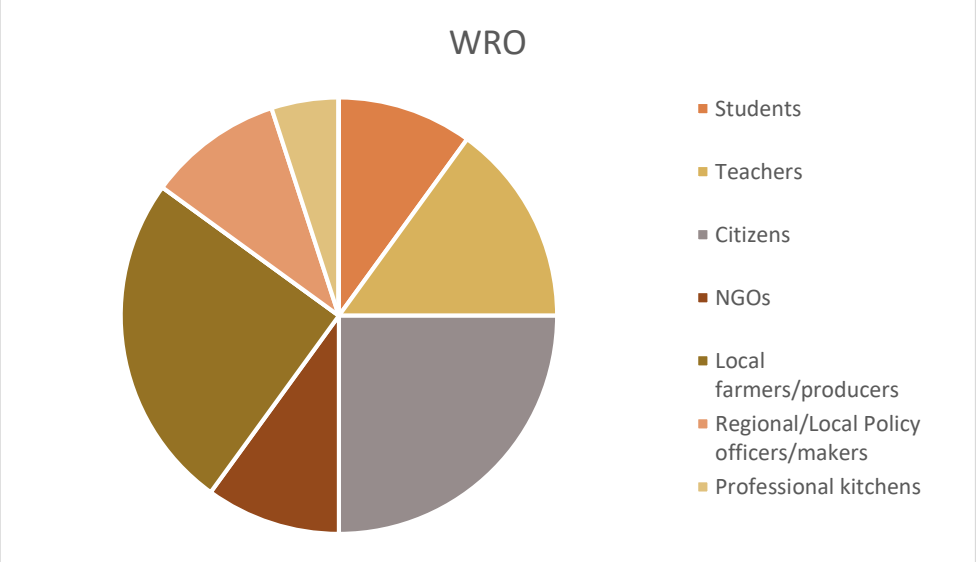


Figure 10.9. Target groups of the Wroclaw FAL

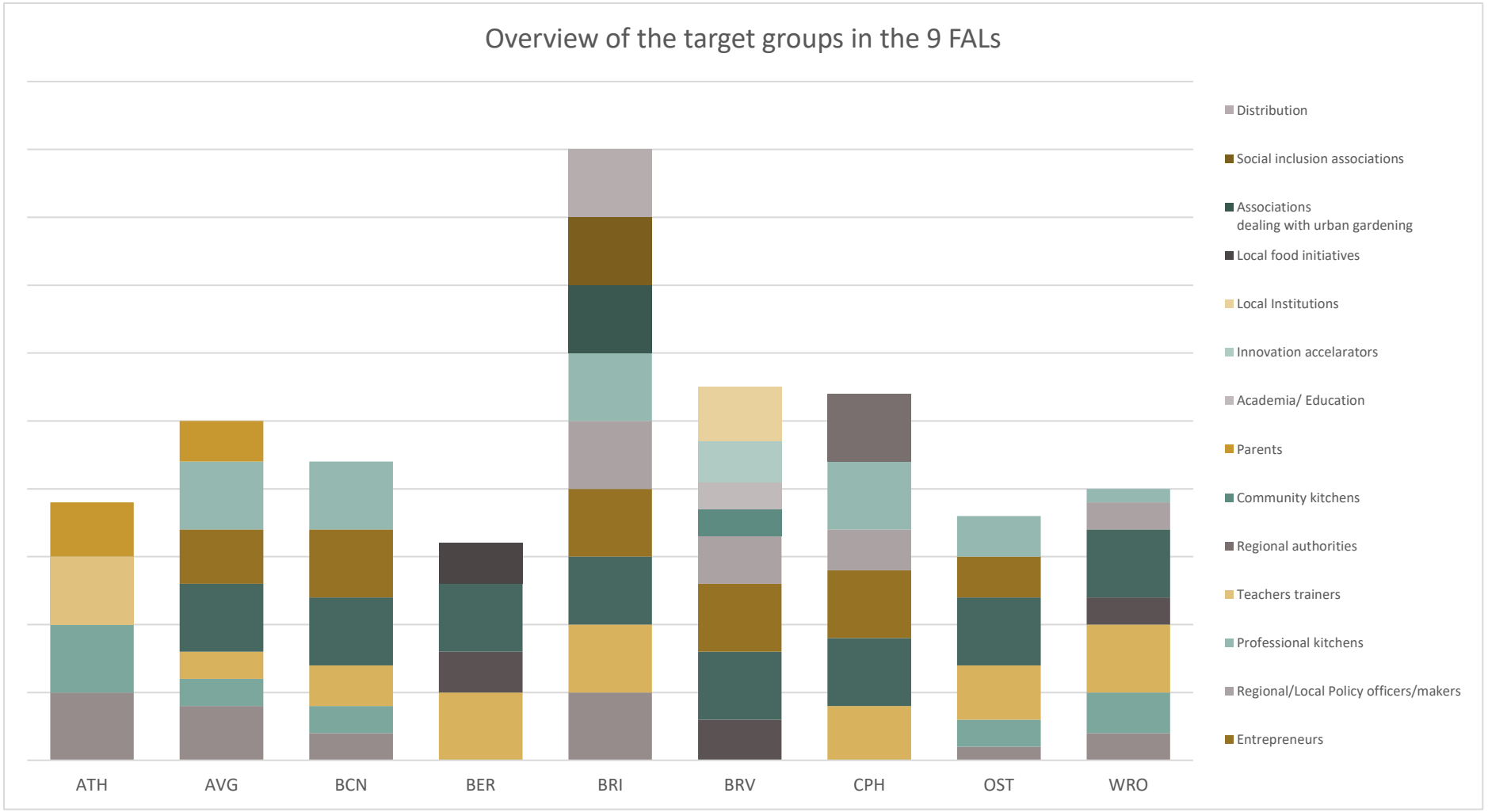


Figure 10.10. Overview of the target groups addressed by the 9 FALs

Challenges

This was the third question the FALs had to answer. This question aimed at outlining which of the challenges (i.e., malnutrition, climate change, urbanisation) that are identified in the context of the FoodSHIFT2030 project are addressed by each FAL. The idea was to link the actions that each FAL aims to implement to these three specific challenges. The scope of this question was to further understand wich of the challenges the FALs want to address and to what extent the FALs activities focus to each of them. For this, they were asked to score from 0 to 5 which challenge is addressed by their FAL, always keeping in mind the actions they plan to implement. However, it was not asked to link each of their planned actions to a specific challenge.

For this, the question posed to the FALs was the following:

Q3. FoodSHIFT2030 project identifies 3 major challenges. Which of the project's challenges do you address with your actions?

i.e. please score out of 5

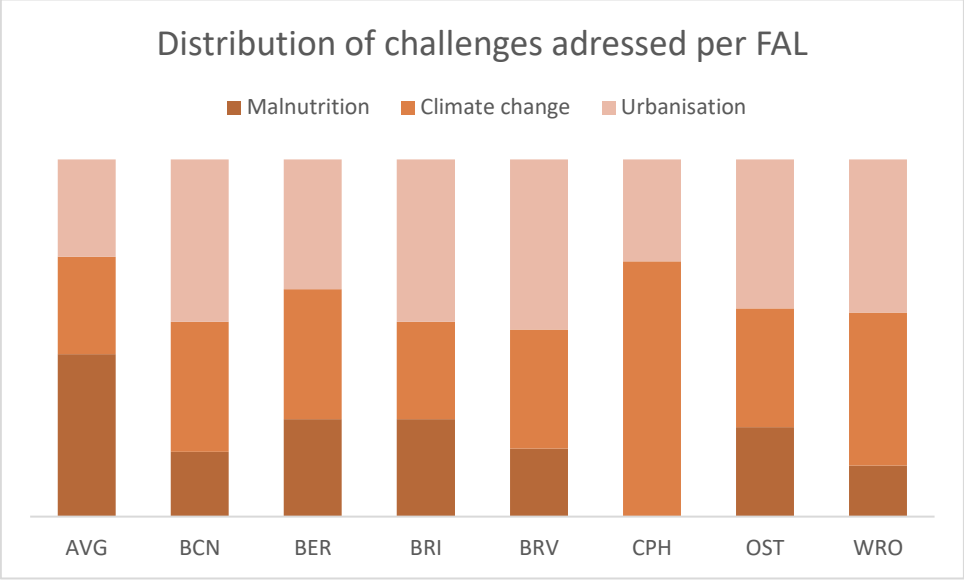


Figure 10.11. Distribution of the challenges addressed by the FALs actions for each FAL

It is observed that eight out of the nine FALs stated that their planned actions address all the three key challenges faced by the food systems, as they were identified by the FoodSHIFT2030 project. What is interesting to notice is that although food systems are directly linked to the food we buy and consume, the challenge of malnutrition is perceived to be addressed at a lower degree than the challenges of climate change and urbanisation by most of the FALs. This was an excellent opportunity to understand which overarching challenges do FALs believe that they contribute to tackle through their planned actions.

General objectives

This was the fourth question the FALs had to answer. This question aimed at outlining which are the general objectives that each FAL has set out in the context of the FoodSHIFT2030 project. The idea was for the FALs to make slighlty broader but still short statements on summarising or/and describing the FAL's future. The scope of this question was to further understand the focus areas of the actions of each FAL. Again in this question it was not asked to link each of their planned actions to a specific general objective. However, it is evident that their answers have taken into consideration the foreseen FAL activities.

For this, the question posed to the FALs was the following:

Q4. What are the general objectives related to your mission and chosen challenges?

i.e. broad statements describing the organization's future[2], this is an open question

The results are presented seperately for each FAL.

ATH
Healthy diets & less meat-based nutrition
Less food waste
Rural-urban gap, reconnection with earth, valuing of food

Table 10.5. The general objectives of the Athens FAL

AVG
Healthy diets
Prevention and less food waste
Recycling of biowaste
Local food systems

Table 10.6. The general objectives of the Avignon FAL

BCN
Using tech to monitor and increase the efficiency of urban food production, elaboration and recycling
Socializing the use of food tech in urban food production, elaboration and recycling through introduction and training of food tech in communities of practice and new communities
Building short, holistic and systemic food supply chains
Upscaling practices through the Fab City & Fab Lab networks

Table 10.7. The general objectives of the Barcelona FAL

BER
Fostering/Building the narrative of local food transition as a common project
Rural-urban gap – short supply chain
Access to quality food for all
Empowerment of local community and citizens
Reducing GHG emissions
Food education/literacy

Table 10.8. The general objectives of the Berlin FAL

BRI
Healthy diets - increase the youth interest in farming and the agrifood sector (employability)
Less food waste promote the use of abandoned lands
Rural-urban gap - favour a more localized and sustainable production

Table 10.9. The general objectives of the Bari FAL

BRV
Promoting short supply chains
Better connectivity between urban and rural areas
Healthy diets through promotion of local products

Local economy enforcement
Less food waste in restaurants and public catering
Process innovation

Table 10.10. The general objectives of the Brasov FAL

CPH
Urban-rural cooperation towards sustainable food systems
Citizen engagement platforms
Upcycled food
Empowerment of local society

Table 10.11. The general objectives of the Copenhagen FAL

OST
Develop food strategy
Further operationalisation of the agricultural park
Awareness raising about sustainable food

Table 10.12. The general objectives of the Ostend FAL

WRO
Awareness-raising through education (citizens, schools, educators, experts, etc) - individual and local contribution through community gardens/responsible consumption/building local communities/etc. to build local resilience
Small-scale living
Increasing/boosting local resilience
Rural-urban gap
Active participation by gardening

Table 10.13. The general objectives of the Wroclaw FAL

It is observed that most of the FALs are in an alignment when it comes to their general objectives. Although sometimes different wording might be used to state or/and describe the general objective, they can be classified under the same broader focus area. This helped identify some key areas of interest across the FALs, such as healthy food, support and empowerment of localised food systems, food waste generation and management, etc. As it was expected, the FALs general objectives focus in their majority on empowerment both of local food systems and citizens.

Solutions & Means

This was the fifth question the FALs had to answer. This question aimed at outlining which of the solutions (i.e., healthy food, reducing GHG emissions, more localised food systems) that are identified in the context of the FoodSHIFT2030 project are addressed by each FAL. The idea was to link the actions that each FAL aims to implement to these three specific solutions, also by including the ways/means this will be achieved. The scope of this question was to further understand which of the solutions the FALs want to address and to what extent the FALs activities focus to each of them. For this, they were asked to score from 0 to 5 which solution is addressed by their FAL, always keeping in mind the actions they plan to implement. However, it was not asked to link each of their planned actions to a specific solution.

Furthermore, they were asked to indicate by what means they can contribute towards the implementation of such solutions. In other words, what means will the FALs use to support and promote each of the proposed solutions. This was asked in order to gain further insight on the perception of the three proposed solutions and how the FALs believe that their planned activities are linked to them.

For this, the question posed to the FALs was the following:

Q5. Under which of the project's solutions do your actions fall? Which are the means to establish your general objectives?

E.g. Healthy food (solution) & raising awareness (mean)

i.e. please only for solution score out of 5

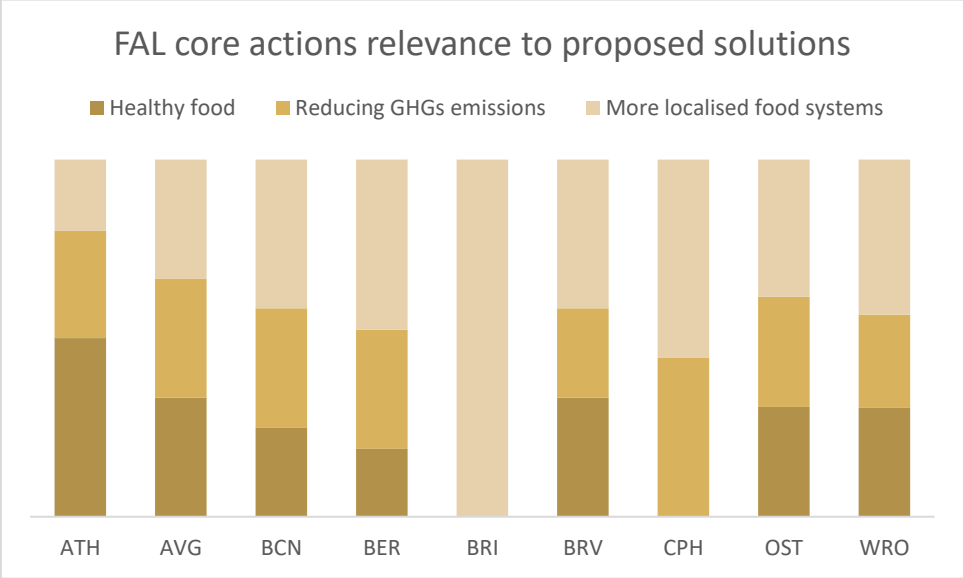


Figure 10.12. Relevance of FAL actions with the proposed solutions

It is observed that seven out of the nine FALs stated that their planned actions address all the three overarching solutions proposed for shifting the food systems, as they were identified by the FoodSHIFT2030 project. What is interesting to notice is that for all the nine FALs the solution of "More localised food systems" is stated to be relevant with their planned activities.

The results regarding the means used by the FALs and how they are linked to the three specific solutions are presented separately for each FAL.

Solution	**Means**
Healthy food	Raising awareness on healthy diets of students Student projects on healthy food/physical activity Monitoring of students' meals and level of physical activity (till March 2021) Students' BMI measurement (internal db-student portfolio) Preparation of healthy meals in school restaurant & canteen or other actual solutions Applying public procurement procedures to boost healthy diets
Reducing GHGs emissions	Raising awareness on food waste Apply solutions (composting units) for food waste treatment Applying public procurement procedures to reduce climate risk/ boost sustainability

More localised food systems	Raising awareness on local food production IT solutions and capacity building for local production Social innovation Applying public procurement procedures to increase local products proportion

Table 10.14. Means of the Athens FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Awareness on healthy diets Applying public procurement procedures to boost healthy diets Preparation of healthy meals Adapt the national nutritional regulation (quality, quantity)
Reducing GHGs emissions	Awareness on food waste Apply solutions (composting units) for food waste treatment
More localised food systems	Applying public procurement procedures to increase local products proportion Social innovation Awareness on local food production Choose “green” local suppliers

Table 10.15. Means of the Avignon FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Raising awareness on locally produced produce (i.e. in vertical and urban agriculture) Emphasizing on maximizing the use of nutrients through food upcycling Collaboration with social initiatives that directly promote healthy meals
Reducing GHGs emissions	Encouraging the development of urban agriculture to limit greenhouse gases Encouraging the development and implementation of local food upcycling to reduce emissions from elaborating and importing food products Using sensors to monitor soil temperature and humidity to optimize plant care and reduce the need for emissions-based additives Apply solutions (local vermicomposting) for food waste treatment and nutrient cycling in the neighbourhood Locally producing food tech that is otherwise produced elsewhere (saving on transportation emissions)
More localised food systems	Promoting technology that can facilitate local food production (i.e. garden sensors, vertical farming techniques, etc.) Creating methodologies for implementing the above mentioned tech in local primary and secondary communities of practice Deploying sensors in local urban gardens to monitor PM10 to provide evidence to overturn local legislation that prohibits urban gardens from selling consumable goods

	Raising awareness on the capacity for local, urban food production

Table 10.16. Means of the Barcelona FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Promote access (physical, financial and socio-cultural) to quality food for all Empowerment of citizens to make choices
Reducing GHGs emissions	Promoting plant based diets Promote solutions for reducing food waste Promote short supply chains reducing long distance transportation
More localised food systems	IT solutions for collective ordering schemes (order and distribution) Social innovation Awareness on local food production Linking producers to food-hubs

Table 10.17. Means of the Berlin FAL to contribute in the proposed solutions

Solution	Means
Healthy food	-
Reducing GHGs emissions	-
More localised food systems	Applying public procurement procedures to increase local products proportion Promote short food supply chains IT solutions and capacity building for local production Social innovation Awareness on local food production Favour new consumption habits linked to social and environmental sustainability

Table 10.18. Means of the Bari FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Awareness on healthy diets (indirectly) Promote local organic products and dishes Raising awareness so local producers can have access to local food procurement
Reducing GHGs emissions	Promote short supply chain Awareness on food waste prevention Promoting more sustainable (climate adaptive) farming practices for local farmers
More localised food systems	Applying public procurement procedures to increase local products proportion IT solutions to shorten the distance and capacity building for local production Social innovation Awareness on local food production

	Promote local products and menus Improve access of local producers in the city market

Table 10.19. Means of the Brasov FAL to contribute in the proposed solutions

Solution	Means
Healthy food	-
Reducing GHGs emissions	Awareness on a more plant based diet in public and private kitchens Awareness on circular economy Apply solutions through upcycling Collection and analysis of relevant data to support the food system agenda and create awareness and recognition
More localised food systems	Fostering the utilisation of online platforms to enhance citizens engagement with various actors in the food system Building hubs and infrastructure to strengthen functions and connections. Awareness about local food production Awareness of revision of national food related policies

Table 10.20. Means of the Copenhagen FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Develop a food strategy, including operational objectives on consumption of healthy food. Awareness on healthy diets (inhabitants, schools, etc.) City council giving the good example (at receptions etc.) Workshops demonstrating reparation of healthy meals
Reducing GHGs emissions	Develop a food strategy, including operational objectives on sustainable transport modes and on food waste. Awareness on food waste Applying public procurement procedures to reduce climate risk/ to boost sustainability Apply solutions for food waste upcycling
More localised food systems	Develop a food strategy, including operational objectives on local food production (identify opportunities, new developments, networks) Awareness on local food production Applying public procurement procedures to increase local products proportion Build a network of local food producers Social innovation

Table 10.21. Means of the Ostend FAL to contribute in the proposed solutions

Solution	Means
Healthy food	Prototyped edible gardens in schools and kindergartens and provide education on permaculture and zero-waste Education on preparation of healthy meals or other actual solutions

	Toolbox with basic seeds
Reducing GHGs emissions	Promoting local producers Twinning local producers and urban eaters Awareness on food waste via prototyped edible gardens in schools and kindergartens
More localised food systems	Identify and promote local producers – direct sales, access in markets Promote social innovation and personal responsibility of urban ecosystems via environmental awareness education Enhanced innovative potential of project stakeholders by providing workshops on social innovations concerning food, citizen co-created spatial intelligence of food system solutions Twinning local producers and urban eaters Prepare info on how to develop urban garden - knowledge database of available & suitable places/areas in the municipality

Table 10.22. Means of the Wroclaw FAL to contribute in the proposed solutions

In this question, it was forseen not to set a strict frame for the "means" that the FALs could include in their answers. This could help in understand their point of view more clearly and indeed it did. What this question showed was that when it comes to solutions the FALs are considering not only the direct effects of their activities but also the indirect. Moreover, as it is highlighted in the DoA, the project has a significant social dimension and this is clearly depicted in the answers provided in this question. Recording the means to contribute to the proposed solutions showed clearly that if the question included only the first section it would be misleading, as especially for the solution of "Reduction of GHG emissions" most of the recorded means are adressing it indirectly. This is of great importance when it comes to selecting impact areas of the FALs activities.

Operational objectives

This was the sixth and final question the FALs had to answer. This question aimed at noting the operational objectives of the FAL, in terms of measurable results each FAL aims at. The idea was to note any clear and plain objectives. The scope of this question was to identify the specific results, if any, the FALs expected through the implementation of their activities.

For this, the question posed to the FALs was the following:

Q6. Does your LAB has set operational objectives?

i.e. Specific, measurable results expected from departments, work groups, and individuals within the organization[2]

You might have not set measurable objectives. Please indicate here what you would be interested in monitoring during your LAB's operation.

Of course it was understandable that each FAL might not have identified quantitative objectives with specific measurable results that early in the project. For this reason, the question was also focusing in desirable qualitative results that the FALs would like to focus on. This provided a more detailed insight on the variety of FALs targets and in combination with the fourth and fifth question on general objectives and solutions respectively helped in outlining the bigger picture regarding the FALs profile. Finally, these operational objectives are non-binding for the FALs rather a preliminary guide for the needs of Task 3.1. The results are presented for each FAL.

ATH
15% reduction of food waste until 2024
Preventing food waste by distributing surplus food
Nº of teachers educated until 2024
Nº of student projects implemented
Nº of educational resources/projects available online

Table 10.23. Operational objectives of the Athens FAL

AVG
Prevention of food waste
Increase the mass of compost produced from the schools in the municipality
Increase the number of local "green" suppliers

Table 10.24. Operational objectives of the Avignon FAL

BCN
tbd

Table 10.25. Operational objectives of the Barcelona FAL

BER
By the end of 2021 first prototype established
By 2023, 5 more food hubs weekly offers for food supply and participation
Nº of farmers involved
Nº of citizens involved
Diversity of citizens involved
Amount of food saved
Amount of food distributed

Table 10.26. Operational objectives of the Berlin FAL

BRI
N° of young people directly involved in farming/agrifood jobs until 2024
N° of citizens involved in new urban farming initiatives
N° of new collaborations among actors within the local food value chain

Table 10.27. Operational objectives of the Bari FAL

BRV
Integration of local producers in the local food system - Revitalizing and activating local gastronomy (no of producers, no of products, no of menus, etc)
Innovation of local products – current recipes (no of new products identified)
Public procurement – improvement of procedures for local producers to have access local market (procedures delivered to public institutions, quantity of food produced under public procurement guidelines)
Improving the market in new technologies – promote local producers, start-ups

Table 10.28. Operational objectives of the Brasov FAL

CPH
Reconnecting the city with its hinterlands; strengthen ties between food chain actors and waste management
Creating 150 new food sector jobs within diversified local food systems in rural areas by 2023.

Maturing 2 new food network clusters
15 new food products or refined food products developed within a circular economy context.
Expanding public-private partnership, Madfællesskabet (The Food Coop) from 4 to 12 municipalities and 12 companies by 2022
Promoting solutions to municipalities in three regions: Nordjylland, Midtjylland, Syddanmark by 2024
Creation of 5 new-food eco systems that are focused on using ingredients that otherwise would not have gone to human consumption, are procured and produced using verifiable supply chains, and have a positive impact on the environment
Delivering input to legislative work on up-cycled food
2% of local canteens & restaurants to implement up-cycled food in their daily food served
10 local food manufacturers to implement up-cycled food ingredients in their products
Educate and empower citizens in demanding up-cycled food products
Development of 1 tool to measure and support transformative change in the food system (ie- by capturing food procurement data)

Table 10.29. Operational objectives of the Copenhagen FAL

OST
Develop a food strategy for the city, in which the newly developed agricultural park Gardens of Stene are the engine for stimulating the local food dynamics. i. Set up a governance structure for an approved food-strategy, which has been realized through active citizen participation ii. Research into distribution-platforms for short supply chain products (i.e. local & regional products)
Strengthen the link between the local producers and the catering sector (restaurants, event sector, large/public and professional kitchen) i. Research into distribution-platforms for short supply chain products (i.e. local & regional products) (Link IF 1) ii. Organize three meeting moments between farmers and the catering sector.
Produce high quality education (awareness raising) on local products, short food supply chains and food waste targeted at chefs. i. Organize four seasonal (online) cooking workshops and two food safaris with and for chefs (Link IF 2). ii. Revised and more healthy kids-menu in 50% of the restaurants in Ostend.
Awareness raising with citizens on short food supply chains and healthy diet i. Make Gardens of Stene dynamic: develop a social meeting place/calender in the Gardens of Stene and link with short supply chain products. ii. Develop a citizen empowerment scheme and implement it in Ostend.
Combating poverty by supporting vulnerable societal groups with food initiatives. i. Create two new food system projects/initiatives targeted at vulnerable societal groups by 2022. ii. Create two new jobs in the domain of social entrepreneurship, related with short chain food supply.

Table 10.30. Operational objectives of the Ostend FAL

WRO

Increase the accessibility of food gardens to different social and aging groups by creating linkages between sustainable local food producers and consumers, education and engagement of stakeholders. i. Education webinars for citizens [No. of webinars, No. of viewers] ii. Education workshops for teachers [No. of workshops, No. of participants] iii. Lab events [No. of events, No. of participants] iv. Created urban farming implementation plans based on public participatory Geographical Information System (PPGIS) combined with GIS Business Intelligence to provide spatio-temporal evidence open for stakeholders [No. of workshops; Draft of urban farming implementation plan]
Creating a procedure for establishing new social gardens with trainings and material support of an urban gardener (Toolbox with basic seeds): i. Procedure ii. Education trainings [No. of trainings, No. of participants] iii. Knowledge base [No. of solutions, i.e. online maps]
Engage young generations with urban farming by providing education and capacity building relating to permaculture, plant based nutrition, zero-waste, importance of pollinators and circular economy solutions. i. Prototyped edible gardens in schools and kindergartens [No. of edible gardens] ii. Education workshops for primary schoolchildren [No. of workshops, No. of participants]

Table 10.31. Operational objectives of the Wroclaw FAL

The first thing to notice is the differentiation in the number of reported operational objectives. Some FALs have not reported any operational objective, while others have reported several. The second thing to notice is the differentiation in the type and detail of the recorded operational objectives. Both qualitative and quantitative operational objectives were included by the majority of the FALs. Moreover, some FALs went through more detailed operational objectives while others kept it shorter. The third thing to notice is the differentiation of organising the operational objectives. Some FALs organised their operational objectives based on their general objectives, others based on their innovation focuses and others did not organised them at all. As it was mentioned in the introduction of this chapter, FALs were free to fill in the questionnaire as they wish so no specific organisational approach was provided, so all the approaches were acceptable and helpful.

Conclusions

Based on the answers of the participants as well as the analysis conducted, it can be concluded that varying perceptions and approaches are adopted by the nine FALs. to begin with, the "Mission" of each FAL was clearly stated and in a condensed manner providing a short but coherent insight for the purpose of each FAL. The same is true for the "Targets groups" addressed by each FAL. Although a great variety of groups and stakeholders is addressed by each FAL.

Regarding the rest of the topics included in this questionnaire, i.e., *Challenges, General objectives, Solutions & Means, and Operational objectives*, these highlighted even more the already evident variation and differentiation of the contexts of the nine FALs. Moreover, the differentiation in perceiving direct and indirect results of the activities to be implemented was brought in the spotlight.

Second level understanding

The following diagramme in **Error! Reference source not found.**6, presents the main outcomes from the conducted reseach, and discussions with the FALs. An overall "framework" is presented, which is composed of the food system components, as well as the various impact areas that the FALs could address. Understanding this "framework", and the LABs "boundaries", is a part of the FALs DNA, and was essential in order to selected later the suitable indicators.

Namely, the following elements were distinguished that "frame" the FALs activities within the FS2030:

FALs: The nine FoodSHIFT FALs (Athens, Avignon, Barcelona, Bari, Berlin, Brasov, Copenhagen, Ostend, and Wroclaw)

Food system components:

- Food supply chain
- Food environments
- Consumers

Impact areas:

- Environmental Sustainability
- Social sustainability and equity
- Economic sustainability
- Urban-rural integration
- Vulnerability and resilience
- Food govevernance

Drivers:

- Political and economic
- Socio-cultural
- Demographic
- Biophysical and environmental
- Innovation, technology and infrastructure

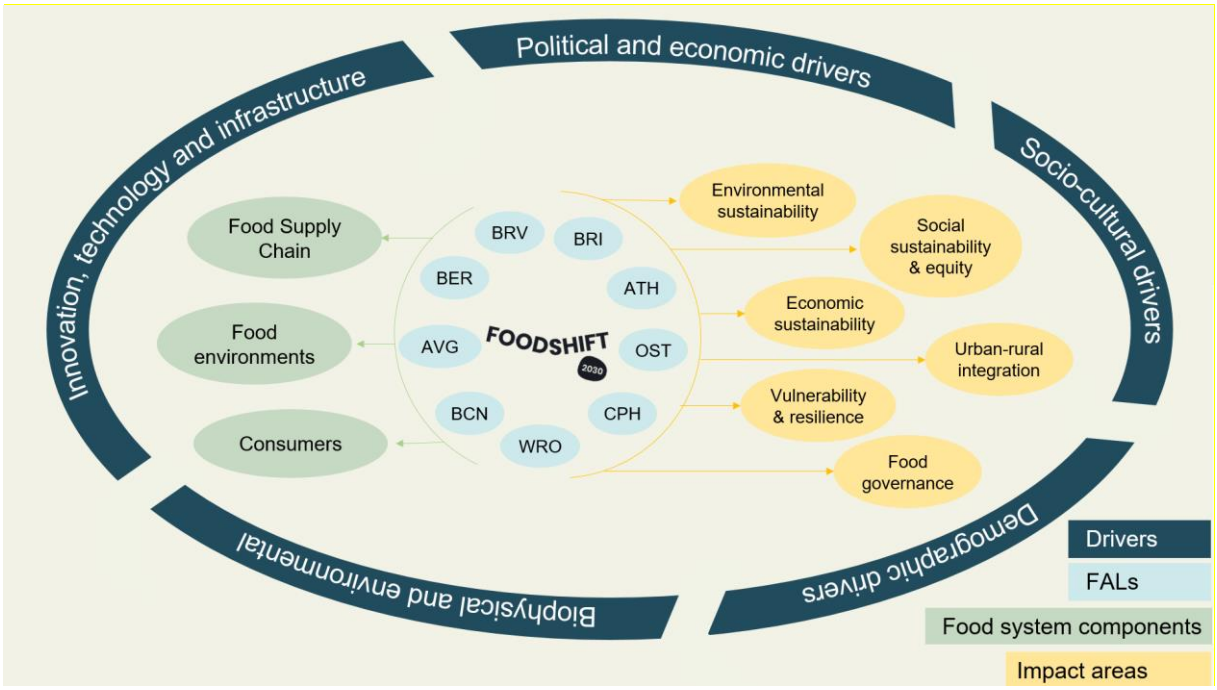


Figure 10.13: Schematic representation of the framework of FS2030 LABs activities

ANNEX IV: Research tools

FAL Questionnaire

Task 3.1: Questionnaire for the FALs

Q1. The mission of your LAB in the context of FoodSHIFT2030 project. i.e. the organization's reason for existence*

Q2. Which are the main target groups/stakeholders of your LAB? i.e. score out of 5 Please feel free to add other target groups not mentioned here					
Students	**Local producers/farmers**	**Teachers**	**Professional kitchens**	**Citizens**	**Entrepreneurs in the food industry**
etc	**etc**	**etc**			

Q3. FoodSHIFT2030 project identifies 3 major challenges. Which of the project's challenges do you address with your actions? i.e. please score out of 5		
Malnutrition	**Climate change**	**Urbanisation**

Q4. What are the general objectives related to your mission and chosen challenges? i.e. broad statements describing the organization's future*		
Q5. Under which of the project's solutions do your actions fall? Which are the means to establish your general objectives? E.g. Healthy food (solution) & raising awareness (mean) i.e. please only for solution score out of 5		
Healthy food	**Reducing GHG emissions**	**More localized food systems**
Mean(s) (e.g. are indicative, please modify as you wish)		
Q6. Does your LAB has set operational objectives? i.e. Specific, measurable results expected from departments, work groups, and individuals within the organization* You might have not set measurable objectives. Please indicate here what you would be interested in monitoring during your LAB's operation.		

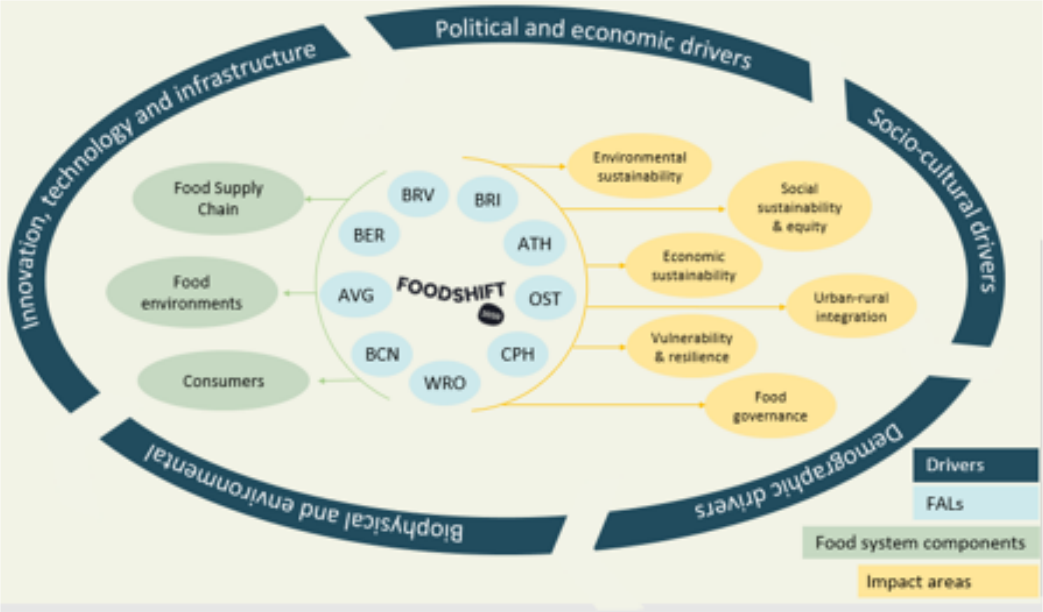
*(Richard L. Daft, Patricia G. Lane, Management, Ninth Edition, 2010, South-Western, Cengage Learning)

Workshop exercise for understanding the relevant framework of FS2030 for the development of suitable indicators

LAB NAME: Athens

Welcome Athens FAL!

As you saw in the presentation, this is the initial conceptual model for Task 3.1 and we want your input on food system components and impact areas addressed by your Innovation Focuses.



Please read the definitions provided and then indicate with 'X' (in tables A, B C, D) the following:

- *The main **food system components** that your innovation focus directly addresses*
  - *Food supply chains (Table A)*
  - *Food environments (Table B)*
  - *Consumers' behaviour (Table C)*
- *The main **impact areas** your innovation focus directly addresses (Table D)*
  - *Environmental sustainability*
  - *Economic sustainability*
  - *Social sustainability and equity*
  - *Urban-rural integration*
  - *Food governance*
  - *Vulnerability and resilience*

You can mark with an X as many options as you like.

We have prefilled the tables with your innovation focuses based on TMTs, GA, and our understanding. Feel free to change them as best suits you 😉

Please work on the MS Teams space to fill in your input.

*Total completion time: **30 minutes**, we propose 10' for Table A, 10' for Table B & C, 10' for Table D*

A. FOOD SUPPLY CHAIN

DEFINITIONS

The **food supply chain** consists of the activities and actors that take food from production to consumption and to the disposal of its waste (Hawkes and Ruel, 2012). The steps of the food supply chain include: production; storage and distribution; processing and packaging; retail and markets *(High Level Panel of Experts on Food Security and Nutrition, 2017)*.

- **Production systems**: Farmers, indigenous peoples, agribusiness, land and plantation owners, fisheries, financial entities
- **Storage & distribution:** Transporters, agribusiness, distributors
- **Processing & packaging:** Packing plants, food and beverage industry, small and medium enterprises
- **Retail & markets**: Retailers, vendors, food outlet owners, traders, restaurateurs, wholesalers, formal & informal markets
- **Waste management:** Waste collection, Waste treatment & upcycling (e.g., composting, biodiesel production etc)

TABLE A. Indicate with an X, which of the elements in Table A does your IF targets.

INNOVATION FOCUS	*Production systems*	*Storage and distribution*	*Processing and packaging*	*Retail and markets*	*Food waste management*
Community empowerment providing hands-on learning opportunities for the food-smart citizens of tomorrow					
Cooperating solutions for using leftovers in school canteens and kitchens				X	X
Social innovation by engaging schools in (re-) connecting young people with land, nature and use summer courses to promote healthy eating and plant-based foods.	X				

B. FOOD ENVIRONMENTS

DEFINITIONS

Food environment refers to the physical, economic, political and socio-cultural context in which consumers engage with the food system to make their decisions about acquiring, preparing and consuming food *(High Level Panel of Experts on Food Security and Nutrition, 2017)*

- **Availability and physical access (proximity):** Food availability refers to the adequate supply of food at the national or international levels. Physical access to food depends first on the built environment (presence of food entry points and adequate infrastructures to access them). Making nutritious foods more accessible and convenient in public places (schools, hospitals, etc.), as well as in home and school gardens, and rural marketplaces to provide greater dietary diversity and quality.
- **Economic access (affordability):** Economic access to food (food affordability) reflects the relative cost of food compared with a household's income and purchasing power. For consumers to be able to purchase and consume the foods that are available within the food environment, these also need to be affordable.
- **Promotion, advertising and information:** Includes activities related to food promotion through various means (including broadcast, print and digital advertising; packaging, labelling and point of sale promotions; branding and sponsorship; merchandising and the use of licensed or brand-based characters). Considering the FS2030 character, all activities related to education and awareness raising are falling under this category.
- **Food quality and safety:** Food quality describes the attributes of a food that influence its value and that make it acceptable or desirable for the consumer (FAO/WHO, 2003). This includes: size, shape, colour, texture, flavour, food composition (ingredients and nutrients), as well as the way food is produced or processed (i.e. "organic", "cage free", "without antibiotics") (Eloros et al., 2010; Grunert, 2005). It also refers to the standards and controls that are in place to protect consumers from unsafe foods.

TABLE B. Indicate with an X, which of the elements in Table B does your IF promote.

INNOVATOIN FOCUS	*Availability and physical access (proximity)*	*Economic access (affordability)*	*Promotion, advertising and information*	*Food quality and safety*
Community empowerment providing hands-on learning opportunities for the food-smart citizens of tomorrow	X		X	X
Cooperating solutions for using leftovers in school canteens and kitchens			X	
Social innovation by engaging schools in (re-) connecting young people with land, nature and use summer courses to promote healthy eating and plant-based foods.	X		X	X

C. CONSUMER'S BEHAVIOR

DEFINITIONS

Consumers' behaviour reflects the choices made by consumers, at household or individual levels, on what food to acquire, store, prepare and eat, and on allocation of food within the household.

TABLE C. Indicate with an X, if your IF targets in influencing consumers' beahaviour

INNOVATOIN FOCUS	*Consumers' behaviour*
Community empowerment providing hands-on learning opportunities for the food-smart citizens of tomorrow	X
Cooperating solutions for using leftovers in school canteens and kitchens	X
Social innovation by engaging schools in (re-) connecting young people with land, nature and use summer courses to promote healthy eating and plant-based foods.	X

D. IMPACT AREAS

DEFINITIONS

For the needs of Task 3.1, the **impact areas** refer to the six overarching key areas, described below, that an innovation can have an impact on, in terms of sustainability and food & nutrition security.

- **Environmental sustainability:** Improve protection and management of ecosystems and environmental resources
- **Economic sustainability:** Increase local economic growth and generate a diversity of decent jobs and income.
- **Social sustainability and equity:** Improve health and well-being and increase access to food and nutrition, improve social conditions for workers, build local food culture & heritage
- **Food governance:** Improve horizontal & vertical governance and planning
- **Vulnerability and resilience:** Reduce vulnerability and increase resilience of food systems
- **Urban-rural integration:** Strengthen the city region food production and supply system

TABLE D. Indicate with an X, on which of the following areas does your IF has an impact.

INNOVATOIN FOCUS	*Environmental sustainability*	*Economic sustainability*	*Social sustainability and equity*	*Food governance*	*Vulnerability and resilience*	*Urban-rural integration*
Community empowerment providing hands-on learning opportunities for the food-smart citizens of tomorrow			X	X		X
Cooperating solutions for using leftovers in school canteens and kitchens	X				X	
Social innovation by engaging schools in (re-) connecting young people with land, nature and use summer courses to promote healthy eating and plant-based foods.			X		X	X

Follow the project

foodshift2030.eu

FoodSHIFT2030

@FoodSHIFT2030

foodshift2030@ku.dk

@FoodSHIFT2030

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 862716.