



CULTiVATE

Briefing Note:

Briefing note on cumulative food sharing initiative impacts in Hub cities: Milan, Barcelona & Utrecht

2025/D3.1

WP 3, T 3.2

Authors: Jennifer Lyons (TCD), Anna Davies (TCD), Daisy Gallagher (TCD)



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



**UK Research
and Innovation**

Technical references

Project Acronym	CULTIVATE
Project Title	CULTIVATE: Co-Designing Food Sharing Innovation for Resilience
Project Coordinator	Trinity College Dublin Anna Davies daviesa@tcd.ie
Project Duration	January 2023 – December 2026 (48 months)
Deliverable No.	D3.1
Dissemination level*	PU
Citing this document (PU research outputs)	Lyons, J., Davies, A. & Gallagher, D. (2025) Briefing note on Cumulative Food Sharing Initiative Impacts in Hub Cities: Milan, Barcelona & Utrecht. Trinity College Dublin.
Work Package	WP 3 – Cost-benefit analysis of food sharing initiatives
Task	T3.2 – Assessment of social, economic and environmental impacts of FSIs
Lead beneficiary	1 (TCD)
Contributing beneficiary/ies	
Due date of deliverable	30 June 2025
Actual submission date	26 June 2025

*PU – Public, fully open, e.g. web (Deliverables flagged as public will be automatically published in CORDIS project's page)

v	Date	Beneficiary	Author
1.0	26 June 2025	TCD	Jennifer Lyons, Anna Davies, Daisy Gallagher

Executive Summary

The sustainability impacts of food sharing initiatives (FSIs) remain largely undocumented, with reporting policies instead trained on large food actors. Using annual **self-reported sustainability impact data** from **12 FSIs** in conjunction with **FSI mapping** in Utrecht, Milan and Barcelona, this briefing note presents **scenarios estimating sustainability impact** generated by FSIs at the urban and peri-urban (UPU) scale in these areas.

As the size and scope of FSIs across the three UPU areas are not captured in the mapping process, we have generated **low, average and high impact values** from the FSI sample (see below). The low impact value is the lowest reported datapoint from our sample of FSIs for a particular indicator. The average impact value is calculated by adding the FSI datapoints for that indicator and dividing by the number of FSIs. The high-impact value is based on the highest reported datapoint.

Pillar / FSI activity area	Key indicator (metric)	Lowest impact value	Average impact value	Highest impact value
Economic / Growing	Contribution to food production (Tonnes)	1.35	12	31.8
Social / Cooking/Eating	Boosting levels of meal sharing (Number of shared meals)	50	1883	5200
Environmental / Distribution	Reducing the carbon footprint of the food system (Tonnes CO ₂ e)	128	665.7	1703
Governance / Multifunctional	Increasing wellbeing through volunteering (Number of people)	20	66	113

These figures are then multiplied by the number of FSIs in the relevant category for each UPU area to generate low, average and high **sustainability impact scenarios**. Both quantifiable and non-quantifiable impacts are highlighted to provide a comprehensive view of FSI contributions across economic, social, environmental and governance pillars.

The sustainability impact scenarios outlined in this report are projections based on a small sample and are therefore exploratory. Rather than providing absolute figures, they act as a guide leading towards more structured data collection, impactful monitoring and reporting, leadership and advocacy for sustainable and resilient FSIs at the UPU scale. The scenarios created through this analysis can be used to frame discussions about the factors which might lead to the different impact scenarios emerging in particular locations and to inform policy making to optimise sustainability impacts through FSIs in the future. It should be noted that while the quantified sustainability impact of individual FSIs may appear small, this belies the deep connections that they create between staff, volunteers and users, and collectively they can create significant qualitative impact. This report includes examples of FSIs showcasing this broader range of contributions, which are not readily captured by quantitative metrics. We also examine impacts from **food retailers** and the impact of **surplus food redistribution**. It also outlines the **key internal and external factors** that shape the impacts created by FSIs. Finally, the briefing note concludes with **recommendations** for future actions to strengthen and expanding sustainable FSI landscapes at the UPU scale, to improve food resilience and meet food waste reduction targets.

This briefing note marks a first step in establishing data on sustainability impacts from FSIs at the UPU scale. To increase the accuracy of estimates at this scale requires accurate reporting of data by FSIs. CULTIVATE is supporting FSIs to report their sustainability impacts through The Food Sharing Calculator. Additionally, further data is also required on the scale of FSIs in UPU locations.

Table of contents

Executive Summary.....	3
1. Introduction.....	6
1.1. What is CULTIVATE?.....	6
1.2. What is food sharing?	6
2. Sustainability impact assessment (SIA) approach	7
2.1. Phase One: Identifying FSIs	7
2.2. Phase Two: Assessing sustainability impacts	7
2.3. Phase Three: Aggregation, estimation & extrapolation	8
3. Comparing impact data across hub cities	10
3.1. FSI contributions to the SDGs	11
3.2. Estimating average impacts at urban and peri-urban scale	11
3.2.1. Economic: Growing FSIs.....	12
3.2.2. Social: Cooking and eating FSIs	12
3.2.3. Environmental: Surplus food redistribution FSIs	13
3.2.4. Governance: All FSIs	14
3.3. High and low impact scenarios	15
3.3.1. Goal: Strengthening and expanding FSI landscapes.....	16
3.3.2. Goal: Planning for UPU food resilience	17
3.3.3. Goal: Meeting food waste reduction targets	18
4. Impact highlights	19
Case study 1: Social restaurant Transforming lives.....	19
Case study 2: Large, public sector-led FSIs Impact through support	19
Case study 3: Food ecosystem innovator Circular food sharing	20
5. Food supply actors in Milan, Utrecht, and Barcelona	22
5.1. Mainstream food retailers	22
5.2. FSI food supply actors	24
6. Conclusion	26
6.1. Recommendations	27
Appendix 1 Sizing of FSIs	28
Appendix 2 Impact areas and indicator categories	29
Appendix 3 Impact assessment at urban and peri-urban scale (aggregate table)	30
Appendix 4 Sustainability impact assessment summary report example	31
Endnotes	34

List of Tables

Table 1 Hub UPU FSI size categorisation.....	7
Table 2 Indicators used for comparative analysis	8
Table 3 low and high annual impact scenarios for each hub location based on annual data.....	15
Table 4 Key impacts from food donation using the Knowledge4Policy food waste calculator ...	23
Table 5 Hub UPU location retailer case studies.....	24
Table 6 Key retailer impacts in hub UPU locations.....	25
Table 7 FSI Sizing approach	28
Table 8 Impact areas and indicator categories	29
Table 9 Average impacts applied at the UPU scale	30

List of Figures

Figure 1 FSI SDG contributions	11
Figure 2 FSI impact pathway supports provided by the CULTIVATE project	26
Figure 3 SIA alignment with the SDGs.....	31
Figure 4 Example of “Food Sharing Benefits” from an SIA summary report	32
Figure 5 Example of "Impacts Highlights" from an SIA summary report	33

1. Introduction

This briefing note presents the sustainability impacts of food sharing initiatives (FSIs) at the urban and peri-urban (UPU) scale in the CULTIVATE hub cities of Barcelona, Utrecht and Milan. It combines data from sustainability impact reporting with the results of FSI mapping in each city, to support policymakers, municipalities, researchers, and FSIs, to better understand the sustainability impacts created by food sharing activities. While sustainability reporting frameworks such as Global Reporting Initiative (GRI), B-Corp, and Social Return on Investment (SROI) are increasingly used by large food corporations in Europe, the contributions of other food actors, including FSIs like community gardens, community kitchens, and food redistribution projects, and smaller independent food retail operators, remain largely undocumented.

Organised into six sections, this document first outlines the CULTIVATE project and the focus on food sharing. Section 2 explains the sustainability impact assessment (SIA) methodology and the aggregation and extrapolation process adopted. Section 3 presents a UPU-level comparison via a suite of sustainability impact scenarios. Section 4 then presents some illustrative impact highlights drawn from the sample of completed SIA reports. Section 5 presents insights from food retail actors, with conclusions and recommendations outlined in Section 6.

1.1. What is CULTIVATE?

CULTIVATE is a four-year Innovation Action funded by the EU Horizon Europe (GA No. 101083377), designed to support sustainable urban and peri-urban (UPU) food sharing and to help make urban food systems more just and sustainable. CULTIVATE is co-designing an online social innovation support platform – The Food Sharing Compass – with FSIs, local authorities, food supply actors, researchers and citizens to: map, track and monitor UPU food sharing; identify the costs, benefits and impacts of FSIs; help actors in navigating governance structures and ensure appropriate policies and regulations of food sharing; support increased citizen engagement in UPU food sharing; and create a community of practice for FSIs. Working collaboratively with multiple actors, CULTIVATE is supporting the development of more sustainable, resilient and healthy UPU food systems helping to achieve the inclusive climate mitigation and adaptation ambitions of the EU.

1.2. What is food sharing?

Food sharing involves collective actions around food between friends, families, neighbours, communities and even between strangers across the food system, from growing, to cooking and eating, surplus food redistribution and community composting¹. FSIs are organisations that help to facilitate diverse forms of food sharing, including sharing food itself, but also seeds, plants, food products and meals, as well as sharing spaces for growing or cooking and eating, and sharing skills and knowledge. FSIs may adopt different organisational forms, including co-operatives and social enterprises, charities and for-profits, and they can be led by grassroots, community, private sector or state actors as exemplified by seed libraries, community gardens, community supported agriculture, community kitchens, and surplus food redistribution organisations.

2. Sustainability impact assessment (SIA) approach

A multi-phased approach was adopted to estimate the sustainability impacts of food sharing initiatives at the UPU scale in the hub cities of Barcelona, Milan and Utrecht.

2.1. Phase One: Identifying FSIs

Initially, FSIs in the three hub UPU locations, Barcelona, Milan and Utrecht, were mapped manuallyⁱⁱ. This manual mapping provided a basis for identifying candidate FSIs for sustainability impact assessment (SIA) reporting. Only FSIs which have a digital footprint through their own website, app, or social media profile were included in the mapping process.

2.2. Phase Two: Assessing sustainability impacts

The second phase involved working directly with FSIs to identify their sustainability impacts. In total, 12 FSIs participated in this phase, one from each broad category of food sharing activity in each UPU location. All FSIs received in-person support to carry out the SIA using [The Toolshed](#), a specifically co-designedⁱⁱⁱ and user-tested^{iv} assessment platform for FSIs to conduct sustainability reporting. As participation in this research is a voluntary process, the FSIs were inevitably self-selecting, however, a variety of different-sized initiatives were involved, eliciting a range of experiences and insights (Table 1). See [Appendix 1](#) for more information on this size categorisation.

Table 1 Hub UPU FSI size categorisation

Food Sharing Activity	BCN	UTR	MIL
Cooking & Eating	Micro	Large	Medium
Redistribution	Medium	Large	Medium
Growing	Small	Large	Small
Multifunctional	Large	Medium	Large

Many of the FSIs had undertaken only limited forms of impact assessment, mainly focused on financial reporting obligations, and were enthusiastic about the opportunity to reflect on their sustainability reporting processes. For example, one FSI had never done a sustainability impact assessment and felt they did not have the capacity to undertake one on their own. Another FSI was in the very beginning of their organisational journey, having been operational for less than a year, and the SIA process provided a useful opportunity for reflection on their goals and impacts. A third FSI was keen to use the information to secure grant funding but had not had time to do an SIA independently, and a fourth was familiar with impact reporting but was interested in connecting with the CULTIVATE project.

The FSIs uploaded their available data related to social, environmental, economic, and governance impacts, with 34 possible indicator categories (see [Appendix 2](#)) and 104 possible data reporting points. Automated reports were then produced through The Toolshed: a full report documenting all impacts, a summary report highlighting key impacts (see [Appendix 4](#)) and an Excel file containing the data submitted. Additionally, the FSIs received a bespoke analysis of their impacts and how these aligned with local policies, along with recommendations for future action to improve their sustainability reporting practices.

2.3. Phase Three: Aggregation, estimation & extrapolation

The third phase involved extrapolation of the identified sustainability impacts at FSI level to the UPU scale. This process uses the results of manual mapping conducted as part of the CULTIVATE project, which geolocated all FSIs with a digital profile (such as website, social media profile or app) and categorised them into their primary activity type: growing, cooking and eating, redistribution, and multifunctional (where an FSI conducts multiple activities).

As the size and scope of FSIs across the three UPU areas are not captured in the mapping process, we generated **low, average and high impact values for selected indicators that all FSIs in that category had reported on** from the FSI sample (Table 2). The low impact value is the lowest reported datapoint from our sample of FSIs for a particular indicator. The average impact value is calculated by adding the FSI datapoints for that indicator and dividing by the number of FSIs. The high-impact value is based on the highest reported datapoint.

Table 2 Indicators used for comparative analysis

Pillar / FSI activity area	Key indicator (metric)	Lowest impact value	Average impact value	Highest impact value
Economic / Growing	Contribution to food production (Tonnes)	1.35	12	31.8
Social / Cooking/Eating	Boosting levels of meal sharing (Number of shared meals)	50	1883	5200
Environmental / Distribution	Reducing the carbon footprint of the food system (T CO ₂ e)	128	665.7	1703
Governance / Multifunctional	Increasing wellbeing through volunteering (Number of people)	20	66	113

The full indicator list is available in [Appendix 2](#) and the wider impact dataset is detailed in [Appendix 3](#).

Cross-location consideration of impacts is possible using the common Toolshed matrix as an anchoring framework. This framework provides a standardised starting point for analysis across sectors, scales and stages of FSIs, providing baseline data that is useful for governing and practicing of food sharing for sustainability. It represents an important first step in detailing the environmental, social, economic and governance impacts of food sharing. In alignment with current norms in corporate environmental, social and governance (ESG) reporting, which

frequently relies on estimated, aggregated and self-reported data^v, this approach allowed careful extrapolation and aggregation methods to develop illustrative impact scenarios. While limited by the small sample size currently, expanding the dataset by encouraging more FSIs to collect accurate sustainability impact data and supporting the FSI sector to embed sustainability reporting will help to improve the scale, comparability and generalisability of the aggregated impacts over time. It should be noted that FSIs create many impacts in areas which are hard to quantify, such as reducing loneliness, supporting community integration, and improving health and wellbeing, which are vital to UPU food system sustainability, and a selection of these are highlighted in [Section 4](#).



3. Comparing impact data across hub cities

The previous sections of this briefing note have outlined the case for examining the sustainability impacts of FSIs and the methodology adopted to do this across the hub UPU locations. Each hub municipality has been provided with a detailed analysis of impact findings from the SIAs completed by FSIs in their jurisdiction. We related those impacts to core food policies in each municipality and provided a preliminary baseline projection of the sustainability contributions made by the FSIs within their UPU location using the sample SIAs collated and the incidence of FSIs mapped through the CULTIVATE project.

In this section, we present the findings from the hub UPU locations together, although this should not be read as a direct comparison; rather, we are presenting potential scenarios of sustainability impact. As outlined in the previous section, to estimate UPU scale sustainability impacts, we created three scenarios: low, average and high. The low scenario is based on multiplying the lowest reported impact from our sample of FSIs for a particular indicator by the number of FSIs in each UPU. The average scenario uses the mid-range reported figure, and the high impact scenario is based on the highest reported figure.

The data presented in this report should be read in the context of:

- The small sample of SIAs conducted by FSIs, which means blunt assumptions are made about the impacts created by those FSIs who have not conducted an SIA;
- The absence of data on the scale of operations across the landscape of FSIs mapped by the CULTIVATE automated mapping tool, which means impacts will be over or underestimated depending on the scale of FSIs, and importantly;
- The unique characteristics of places shaped by global geopolitical events as well as diverse histories, economies, policies, cultures and physical environments, all of which evolve over time.

Despite these challenges, there is merit in exploring differences in the composition and impacts reported in the hubs. It provides baseline data that can be refined over time as more SIAs are submitted and provides policymakers and FSIs with possible scenarios to shape discussions around future UPU food system transformation, providing details on how FSIs create positive benefits for those who engage with them.

Overall, the FSIs completing SIAs in Utrecht are large initiatives, with only the multifunctional FSI being medium scale. Therefore, extrapolating the impacts from this sample to the full population of FSIs in Utrecht is likely to overestimate the sustainability impacts being generated. Meanwhile, the range in both Barcelona and Milan is more balanced, with small, medium and large FSIs in the mix, albeit this range spans different sectors of food sharing. It would therefore be erroneous to simply compare the estimated impacts at the UPU scale from the sample conducted in Utrecht with those collated across the other two cities.

3.1. FSI contributions to the SDGs

The Toolshed SIA aligns impact indicator questions with each of the SDGs. When FSIs submit data related to a particular indicator question in the Toolshed, this automatically indicates the contribution in reports to the FSIs. The contributions of the case study FSIs to the SDGs are visualised in Figure 1. Analysis of the contributions across the sample shows that SDGs: 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 15, 16, 17 were common to all growing, cooking and eating, surplus food redistribution (SFR) and multifunctional FSIs. The only differences are found in Barcelona. In this case, the growing FSI contributed to SDG 7 (clean energy) and 14 (life below water) but not SDG 6 (clean water and sanitation). The SFR FSI filled this gap by contributing to SDG 6 through its closed-circuit irrigation system. In Utrecht and Milan, however, the multifunctional FSIs did not report alignment with SDGs 7 and 14. Notably, the multifunctional FSI in Barcelona had the widest contribution in the sample, covering SDG 14 due to their holistic agricultural practices.

SDG									
UPU	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	
Barcelona									
Utrecht									
Milan									
SDG	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS
Barcelona									
Utrecht									
Milan									

Figure 1 FSI SDG contributions

While it is useful to see where FSIs align with and contribute to the SDGs, as these goals were not designed for the UPU scale, there is less direct relevance of FSI work to the detailed targets underpinning them. For more granular insights into the types and nature of the impacts created by FSIs, it is important to examine the details generated through the reporting process. Selected insights are presented in the following section.

3.2. Estimating average impacts at urban and peri-urban scale

In this section, quantitative impact data for the selected indicators from the three hub location reports was averaged and multiplied by the number of relevant FSIs in each category across the three UPU locations to generate comparable projected impacts. A summary of the dataset is detailed in [Appendix 3](#). The selected indicators enabled assessment across all sustainability pillars and were chosen because they are either closely linked to specific FSI activities or are core to all types. This approach highlights impacts that are both quantifiable and key to FSI operations.

3.2.1. Economic: Growing FSIs

The growing FSIs in our sample have multiple goals to create social, environmental and economic impact, but growing food is the lynchpin for creating those impacts. Many of these impacts are hard to quantify, such as the health and wellbeing benefits of spending time cultivating plants alongside others. In this section, we focus on just one impact dimension of growing FSIs that is quantifiable, their food-producing capacity (in tonnes), although it can be noted that many growing FSIs do not seek to optimise or even record food productivity, per se, but see this as one element of a multifaceted sustainability impact.

Average contribution to food production per growing FSI = 12 tonnes

Estimated food production capacity from FSIs in:

Barcelona = 985 tonnes

Utrecht = 465 tonnes

Milan = 427 tonnes

While projections suggest that Barcelona produces more than twice the amount of food via growing initiatives than either other UPU, it has nearly three times as many growing FSIs (84.7) as Milan (36.7) or Utrecht (40). Proportionally, growing FSIs account for 38% of all FSIs in Barcelona, and 44% in Utrecht, compared to just 34% in Milan. However, when considering the population of each UPU location, Utrecht has nearly five times the provision of collective growing spaces (one growing FSI per 14,388 people) compared to Barcelona (one growing FSI per 67,296 people). Milan has one growing FSI per 87,193 people.

This impact can be used to estimate the economic savings made to food budgets for those who engage in collective growing. At the UPU scale, it contributes to greater food resilience and can offset some of the public costs associated with food insecurity. The precise value of this saving is highly localised, so figures in Euros are not included here.

3.2.2. Social: Cooking and eating FSIs

All FSIs create social impacts, this is at the very core of their mission and goals through the collective acts around food. In this section, we focus one element of this, the number of social interactions facilitated by cooking and eating FSIs. This is indicated by the number of meals shared. It is worth re-emphasising that this is just one indicator from among many, and does not necessarily represent unique or novel interactions, but rather the opportunities for commensality over a shared meal.

Average number of meals shared per annum per cooking and eating FSI = 1883 shared meals

Estimated number of meals shared per annum from cooking and eating FSIs in:

Barcelona = 86,068 meals

Utrecht = 52,733 meals

Milan = 59,702 meals

In Barcelona, just 21% of FSIs are focused on cooking and eating, compared with 30% in Milan and Utrecht. However, Utrecht has one cooking and eating FSI per 20,554 people, compared with one per 100,946 in Milan and 124,726 in Barcelona. The density of collective cooking and eating

initiatives also varies widely across UPU settings. Further analysis of the infrastructures for the state provision of food is needed to understand this data better, alongside consideration of historical and cultural differences in collective eating practices across the locations.

More than simply representing the absolute number of meals served and the material sustenance for physical health that this supports, these figures indicate significant moments of interaction that help to reduce loneliness for participants and enable FSIs to flag wider mental health supports, either through formalised or informal referral processes. In effect, they provide a quantifiable proxy to indicate a suite of more qualitative and complex impacts. These initiatives provide food as a medium for social connection, intercultural exchange and solidarity. These wider impacts are discussed in the impact highlights in [Section 4](#).

3.2.3. Environmental: Surplus food redistribution FSIs

All FSIs create some kind of environmental impact. Indeed, environmental drivers are among key reasons for establishing FSIs. For surplus food redistribution (SFR) FSIs, a key goal is removing edible food from the waste stream and ensuring it becomes available to those who need it. This provides a suite of positive environmental impacts, reducing emissions from landfill, as well as ensuring that the water and energy used to grow food are not wasted. Further detail on the environmental impacts of SFR, as well as economic and social impacts can be found in [Section 5.1](#). The metric considered here is average carbon savings due to food waste reduction.

Average carbon savings due to food waste reduction per annum per SFR FSI = 665.7 t CO₂e

Estimated carbon savings from FSIs in:

Barcelona: 60,382 t CO₂e

Utrecht: 15,978 t CO₂e

Milan: 25,764 t CO₂e

There are significant differences in estimated contributions to this metric across the three UPU contexts. The differences in absolute numbers are due to the higher incidence of SFR in Barcelona (90.7), with more than twice as many SFR FSIs compared with Milan (38.7) and four times as many as Utrecht (24). In Barcelona 41% of all FSIs are SFR initiatives, not dissimilar to Utrecht (36%) but higher than Milan (26 %). Once again, Utrecht, while having fewer SFR FSIs, has the lowest population per SFR FSI (one per 23,979 people), compared with Barcelona (one per 62,845 people) and Milan (82,687). However, further data is required about the scale of these operations by initiatives to fully estimate impacts. For example, Milan's Food Waste Hubs, coordinated by the municipality, which received financial support via the 2021 Earthshot Prize, can operate at scale. In this case, while there might be fewer SFR FSIs in Barcelona, they could be large operations creating significant impacts so cumulatively creating the same impact as more smaller initiatives. More information on the scale of FSI activity at the UPU scale is needed to fully explore this issue.

3.2.4. Governance: All FSIs

Almost all FSIs who completed SIA for the CULTIVATE project involve volunteers in their work in some way or another. These volunteers are not only vital members of the FSIs workforce, ensuring that activities can be supported, they are also important participants in the work of FSIs, both benefiting themselves through the interactions and experiences and helping to create positive sustainability impacts for others. Importantly, FSIs often fill gaps in state care infrastructures. As part of the SIA, FSIs are asked: “How many volunteers have reported that their physical health and wellbeing has improved through participating in your initiative?” This question provides a valuable insight into the personal benefits of volunteering within food sharing initiatives. As total volunteer numbers are not requested, this wellbeing metric offers a proxy for understanding civic engagement, though it will underestimate the overall scale of volunteering contributions. This indicator is used in all FSI sectors for this analysis, and the average number of people experiencing positive impacts from volunteering per annum is detailed below:

Average number of volunteers experiencing improvements in wellbeing per annum per FSI = 66 people

Estimated number of volunteers experiencing wellbeing benefits from all FSIs in:

Barcelona = 14,623 people

Utrecht = 6,087 people

Milan = 7,080 people

While Barcelona has the most volunteers in this averaged scenario, in terms of density, Utrecht stands out, with one FSI serving 4,255 people, far higher than Barcelona (one FSI per 7,493 residents) and Milan (one FSI per 11,738). This suggests historical differences in urban form, cultural practices over food growing, land availability, and proximity to peri-urban cultivation spaces, however further investigation would be needed to fully understand the drivers behind these variations.

Overall, this section provides the best available estimates of sustainability impact at the UPU scale. It demonstrates that despite the low level of provision of any type of FSI, considerable contributions are made to UPU food system sustainability, in ways which are seldom reflected in policy statements and resource investments. While further work is required to develop confidence intervals for the sustainability impact estimates generated by the CULTIVATE project and to expand the impact dataset, the existing information still provides a useful departure point for conversations within FSI communities, and between FSIs and municipal actors, about future impact pathways for the sector.

In the next section, we provide alternative impact scenarios for each hub UPU location using the lowest and highest impacts reported and suggest ways in which these impact scenarios could be used to foster dialogue among stakeholders and co-design plans for optimising sustainability impacts.

3.3. High and low impact scenarios

Estimating from limited samples to shape policy agendas is not unusual in the environmental field, where data collection can be fragmented, incomplete and using different parameters. For example, the United Nations Environment Programme (UNEP) (2021)^{vi} states that global estimates of food waste have long relied on extrapolating data from a small number of countries, often using old and incompatible data. They note that few governments have robust data on food waste to make the case to act and prioritise their efforts. Yet food waste policies are still developed, with statistics such as ‘a third of all food being lost or wasted’ regularly used to justify these. We argue that the data from sustainability impacts from FSIs should be seen in the same vein.

In this section, we present low and high-impact scenarios, based on the data from the sample FSIs across the 3 UPU locations. The low scenario is based on multiplying the lowest reported impact from our sample of FSIs for a particular datapoint by the number of relevant FSIs in each UPU. The high-impact scenario is based on the highest reported figure. For the governance scenario, this is cross-cutting and all FSIs were included in the calculation.

A key feature when comparing these scenarios is the large range between the low and high impact scenarios in each category. For example, the estimated food production scenarios from FSIs in Barcelona range from 114.35 tonnes to 2,693 tonnes annually. The size of FSI makes a significant impact on estimations here, although it should not be assumed that size is always directly correlated with impacts. For example, certain growing FSIs might emphasise growing culturally appropriate food that resonates with new residents in the UPU locations to foster greater community cohesion. Nonetheless, a combination of access to appropriate spaces, investment, government support, and community engagement could unlock significant sustainability dividends in terms of both food production and co-benefits like CO₂e reductions and social cohesion. Similarly, in the high-impact scenario for Barcelona, the number of volunteers reporting wellbeing impacts quadruples, surging to 24,973 people from the low estimate of 4,310, with the other UPU locations also seeing a difference of around 10,000 people between the low and high estimates.

Table 3 low and high annual impact scenarios for each hub location based on annual data

Scenarios	Low	High
Indicator categories & UPU location		
Economic: Contribution to food production (tonnes)		
Barcelona	114	2,693
Utrecht	54	1,272
Milan	50	1,167



Social: Meals shared (number of meals shared)		
Barcelona	2,285	237,640
Utrecht	1,400	145,600
Milan	1,585	164,840
Environmental: Reducing carbon footprint of the food system (amount in t CO₂e)		
Barcelona	11,610	154,445
Utrecht	3,072	40,867
Milan	4,954	65,899
Governance: Increased wellbeing through volunteering (number of people)		
Barcelona	4,310	24,973
Utrecht	1,794	10,396
Milan	2,087	12,091

These figures, in combination with the average impact scenario elaborated in Section 3.3, can be used to frame discussions about the factors which might lead to the different scenarios emerging in particular locations, including: the availability of skills and spaces for the establishment of FSIs and to report on their impacts; appropriate policies to support the establishment and maintenance of FSIs; and citizens who want and be able to engage with food sharing activities. Such discussions could lead to the identification of new spaces for FSIs for growing (such as rooftops or church grounds) and further dialogue between FSIs and municipalities that have influence over land use decisions and resource allocations for integrating FSIs and their impacts into development plans. These discussions could act as a springboard towards the development of targets around food sharing to support transitions to more resilient and sustainable UPU food systems. We outline some potential ways such scenario data can be used to address particular goals.

3.3.1. Goal: Strengthening and expanding FSI landscapes

Not only do hub cities exhibit diversity in terms of absolute numbers of FSIs in their area (Barcelona, 221; Utrecht, 92; and Milan, 107), they also have different-sized populations, and therefore, the numbers of inhabitants per FSI^{vii} varies considerably. Milan, with 11,738 inhabitants per FSI, has nearly three times more residents per each FSI than Utrecht (4,255), while Barcelona (7,493) has nearly twice as many residents per FSI as Utrecht. Based on this, Barcelona and Milan could consider using Utrecht figures as a target to improve access to FSIs across their populations. They could also use this number of FSIs to estimate the expansion of impacts that this might deliver. For example:

Milan: $11,738 \times 107 = 1,255,966$ population

Milan would need $1,255,966 / 4225 = 295$ initiatives to have the same ratio as Utrecht, requiring an additional 188 FSIs.

Barcelona: $7493 \times 221 = 1,655,953$ population

Barcelona requires 392 FSIs to have the same ratio as Utrecht, this would mean an additional 171 FSIs would need to be established, assuming each one creates the average impacts set out above. As such, any target setting based on FSI density should be complemented by qualitative assessments of service delivery and social impact. Using the CULTIVATE SIA tool provides a means to conduct and monitor this.

The low, average and high sustainability impact scenarios presented in this briefing note could be employed to estimate the range and nature of potential added impacts created by supporting the creation of these additional FSIs. Varying proportions of the categories of FSI types - growing, cooking/eating, surplus food redistribution and multifunctional - could be explored to identify the different kinds of impacts that this would make, helping to tailor supports to key areas of need within UPU food systems.

3.3.2. Goal: Planning for UPU food resilience

The COVID-19 pandemic gave a stark indication of the kinds of shocks UPU food systems may face in the future due to climate change, biodiversity loss, and continuing global geopolitical conflict. During the pandemic, many FSIs were forced to close their doors as they were categorised as non-essential services. However, FSIs do provide essential services for sections of the population in the communities where they operate, particularly amongst vulnerable and marginalised groups. Certainly, in some locations, FSIs had greater knowledge of those at risk than municipal departments^{viii}. The scenario data can also be used to identify possible impacts from future shocks which would threaten the operation of FSIs and affect various social, economic, and environmental impact contributions as a result. For example, estimates could be established for the impact of closing all community gardens due to another contagious pandemic. This could play an important role in resilience planning at the municipal scale.

Data from the impact scenarios can also be used by municipalities wishing to meet the needs of particular sections of their population better, to build greater resilience. For example, collective cooking and eating initiatives can provide an important site of connection for people who are new to the area; community growing initiatives provide opportunities for both enhanced health through access to fresh locally grown food, and physical exertion through gardening, as well as providing opportunities for social interaction, reducing loneliness. Surplus food redistribution initiatives provide multi-sided benefits, such as reducing food waste going to landfill and providing food for people in need.

3.3.3. Goal: Meeting food waste reduction targets

Mandatory food waste reduction targets in Europe mean that this is one of the few areas where policy drivers directly support FSI activities, particularly in relation to surplus food redistribution (SFR) initiatives. Under the revised Waste Framework Directive^{ix}, the EU has introduced a mandatory 30% per capita reduction in food waste at retail, restaurants, food services and household level.

The impact scenario data can be used to provide an indication of the potential range of food waste diversion rates that an individual SFR FSI could be expected to deliver within the UPU area, based on current operational capacity. By applying these estimated diversion rates to a hypothetical expansion of the SFR sector, it is possible to assess the scale of sectoral growth required to contribute meaningfully to nationally mandated food waste reduction targets. This approach enables policymakers and practitioners to estimate how much the SFR sector would need to expand within the UPU area to support compliance with national food waste reduction obligations at UPU scale.

The scenarios presented in this section are then useful for strategic planning. However, it is also important for municipalities to understand the nature and specificities of impacts from particular types of FSIs. In the following section, we highlight a range of impact cases that illustrate this.

4. Impact highlights

FSIs adopt multiple forms, from loose networks to formal charities and social enterprises. They are led by diverse actors from grassroots groups to social entrepreneurs and municipal actors. In this section, we highlight the specific impact characteristics of a hyper-local cooking and eating FSI, large-scale municipality-led FSIs, and a circular food initiative, highlighting a broader range of contributions generated by FSIs that, while difficult to aggregate, capture diverse and nuanced impacts that are central to the mission and vision of many initiatives. The case studies presented are selected not for their prevalence across the sample, but because they offer valuable insights for understanding the full impacts of FSIs within their communities.

Case study 1: Social restaurant | Transforming lives

Cooking and eating initiatives tend to be smaller in scale and scope than other FSIs. This is often due to the localised nature of social needs around food access and due to the scarcity of large premises available at affordable rents for FSIs. As a result, the quantitative sustainability impact of individual cooking and eating FSIs may appear small, but this often belies the deep connections that they create between staff, volunteers and users, that collectively can create significant impact.

In the CULTIVATE sample, one cooking and eating FSI, a social enterprise, has a dual function: a community meeting point around food and a training centre for cooking and eating skills for individuals marginalised from mainstream employment, including people with mental health challenges, refugees, and young people excluded from education and work opportunities. The model provides stability for the trainees who join its internship programme, which provides them with skills and experiences that are useful for future jobs both in the sector and more broadly. They learn self-efficacy and self-care through their customer-facing work, increasing their self-confidence, resilience and wellbeing. The concept is innovative because it brings together commercial activity and social care. However, the FSI has found it challenging to retain funding streams as the enterprise matures, due to the lack of funding available for core infrastructure and a constant push for innovation by grant-awarding bodies.

Impact highlight: Trainees on the FSI internship benefit from extensive support from tutors and role models that they shadow in the restaurant, playing a key role in sustaining their engagement in the programme and acquiring important skills.

Case study 2: Large, public sector-led FSIs | Impact through support

In both Utrecht and Milan, there were FSIs led by public sector actors. In Utrecht, one public sector-led FSI is an edible neighbourhood (a growing FSI), and in Milan, one is focused on neighbourhood food redistribution hubs (a redistribution FSI). Both initiatives benefit from the security of tenure provided by being public sector-led or funded; this creates a stable infrastructure and the possibility for more strategic planning.

Edible neighbourhood | Social cohesion

This community urban growing initiative is an innovative model for social infrastructure within an urban residential context, fostering community through community engagement, volunteering and inclusive public events. Over a year, more than 750 residents have reduced household food costs by accessing locally grown produce in return for engagement with the activities of the FSI. Beyond addressing food access, the initiative has become a hub for social cohesion and intercultural connection.

Impact highlight: More than 1,500 individuals took part in events designed to build community and friendship, strengthening the social fabric of the neighbourhood. This led to other spin off food sharing initiatives in the area and significantly improved relations amongst residents creating greater inclusion.

Neighbourhood food redistribution hub | Surplus food redistribution

This food redistribution hub utilises a systems-thinking approach, connecting the dots between surplus, need and community knowledge. The hub functions as a redistribution point, but also as a dynamic, adaptive infrastructure that leverages the strength of existing organisations and local networks. Importantly, the composition of food redistributed is predominantly fruit and vegetables (50%), nutritionally rich and highly perishable, making its diversion from waste streams especially impactful environmentally and socially. Vegetarian and vegan choices are promoted through educational programmes. Participants are able to select the food they rescue, helping to create a sense of autonomy and dignity.

Impact highlight: Approximately 772,000 portions of fruit and vegetables are distributed annually by the hub, reducing food miles and the carbon footprint of urban food systems, whilst also supporting healthy and sustainable diets for people experiencing food poverty.

Case study 3: Food ecosystem innovator | Circular food sharing

One multifunctional FSI provided the clearest demonstration of a circular food system in action. It creates an ecosystem of sustainable circular bioeconomy from gleaning leftover harvests, creating novel products from this food and distributing these to nearby social supermarkets for local residents. On average each gleaning activity recovers between 1.5 and 1.6 tonnes of food that would otherwise be lost or ploughed back into the soil.

This food-loss prevention creates a downstream cascade of benefits throughout its multi-stakeholder model, strengthening circularity by working closely with producers, local authorities, volunteers, NGOs and other food initiatives. Access to fresh produce was granted to 3,857 people in the reporting year, and although the monetary value of food redistributed is not quantified, it reduces beneficiaries' food costs and alleviates financial strain on social services by improving food security. Additionally, it creates employment opportunities for vulnerable individuals and provides training and employment in food production, with 50% of trainees going on to find work after participating in training, thus contributing to inclusive economic participation.

Impact highlight: Operationalising a circular food economy by involving volunteers in the collection of surplus food from a network of landowners and producers, reducing food loss, whilst also providing space for jobs, training and skills development in innovative food product development from the surplus food collected, which is then made accessible to food-insecure individuals through a social supermarket supporting access to healthy and sustainable food.

FSIs are not isolated initiatives, they are deeply embedded in their local food system, connecting with actors across the food chain. In the CULTIVATE project, we specifically considered their connections with retail actors, and the findings are summarised in the following section.

5. Food supply actors in Milan, Utrecht, and Barcelona

Food supply actors are influential in shaping UPU food systems. For effective transitions to more sustainable food systems, these actors must be part of discussions as they help shape the actions of upstream suppliers in the food chain through procurement as well as curating food choices for customers downstream. For the CULTIVATE project, it is essential to understand the impacts created by food supply actors that intersect with the activities of FSIs. This might be as farmers who engage with gleaning FSIs, mainstream retailers donating food to FSIs, such as community kitchens or surplus food redistribution initiatives, or it could be that the food supply actors are themselves FSIs as they promote collaborative acts around food, such as community supported agriculture schemes, food co-operatives or social supermarkets. We consider both of these routes to impact in this section.

5.1. Mainstream food retailers

Retailer practices directly influence the management of food and the occurrence of food surplus and waste. In 2022, the United Nations Environment Programme (UNEP) reported that 12%^x of food waste occurs at the retail level, while in the European Union (EU), Eurostat reported that restaurants and food services contribute 11% of overall food waste, while retailers and other food distribution sites create 8%^{xi}. The retail sector is a significant contributor to food waste, and the EU has set ambitious targets to address the issue. In 2023, the Waste Framework Directive was revised to accelerate the EU's progress towards the Sustainable Development Goal (SDG) Target 12.3, with the legally binding food waste reduction targets to be achieved by 2030 adopted in July 2023. Specifically, member states are required to reduce food waste from retail and consumption (restaurants, food services and households) by 30% per capita from 2020 levels by 2030.




Sustainability reporting can help retailers document their environmental, social and governance (ESG) impacts and identify ways to reduce negative impacts, such as food waste, and expand positive ones in line with their goals. Within the mainstream commercial retail sector in the EU, attention has been focused on the Corporate Sustainability Reporting Directive (CSRD)^{xii} and its developments. In recent years, the form and focus of CSRD have shaped ESG approaches in many companies, directing the nature of data collected and the ways that different sections of businesses work together. However, the recent pause and revision in European Sustainability Reporting Standards (ESRS) have created uncertainty within the sector about how and when to engage.

It was in this context of uncertainty that CULTIVATE researchers sought to engage mainstream retailers who donated surplus food in each of the Hub cities, Barcelona, Utrecht and Milan. Six mainstream large-scale retailers were approached, one in Barcelona, three in Utrecht, and two in Milan, to explore their interest in detailing the sustainability impacts of the food they redistribute, using Sharing Solutions Services to estimate the sustainability impacts they create as a result. Connections and introductions were made by key local stakeholders in municipalities in each case, as well as via partner FSIs in the Hub cities. Amongst large supermarket retailers, there was significant interest in participating at the individual store level; however, permission

from headquarters to participate in our sustainability impact reporting trials was not approved, with concerns about commercial confidentiality around sharing data on donations to a third party and uncertainty about future demands of CSRD key responses.

Table 4 provides a summary of estimated impacts from surplus food redistribution using the **Knowledge4Policy** food waste calculator. These figures could be used to estimate the sustainability impacts for a retailer's food donations. While some studies suggest that donating food can lead to negative rebound effects, the overall climate benefit of donating food still outweighs other mechanisms^{xiii}.

Table 4 Key impacts from food donation (Source: [Knowledge4Policy](#) food waste calculator)

Pillar	Key impacts from 1kg of surplus food donated ^{xiv, xv}
Social 	<p>Improving health and wellbeing, building community resilience, alleviating food insecurity.</p> <p>Estimating that each kilogram of donated food equals roughly two full meals, this offers over 1,500 kilocalories, enough to sustain an adult for a day. Providing the food donated is healthy and nutritious, this can support food security, ensuring that edible surplus food feeds people, not landfills. Mechanisms for distributing surplus food can also create positive connections within communities, including volunteers and recipients, building community cohesion.</p>
Economic 	<p>Cost savings for recipients, support for local economies, reducing government spending on waste services and welfare supports</p> <p>It is estimated that each kilogram donated saves €3.65 in avoided costs due to wasted food production (growing, packaging, and transport) (€3.51) and waste disposal (€0.16), reducing pressure on municipal systems and landfills. Additionally, there is an economic cost saving by recipients of the donated food from avoided grocery costs. This means household budgets can be reallocated to other needs. The precise value of this economic cost saving will vary widely from place to place due to local food costs and other factors, so it is hard to estimate a singular value for the EU. FareShare in the UK estimates that each kilogram of food redistributed provides around £2.91 in retail value. This is an economic benefit for recipients, who can redirect savings to other basic needs^{xvi}.</p>
Environmental 	<p>Reducing food waste, reducing emissions from landfill and incineration, supporting sustainable consumption</p> <p>Food waste represents a significant loss of resources used in production (water, soil, energy) and processing, packaging, and transport. Donating food minimizes this waste and saves these resources. Studies indicate that each kilogram of food saved from landfill or incineration prevents 0.5 m² of new land from being used to grow food, 1 tonne of food would save 500m² (equivalent to half a tennis court). This helps protect biodiversity, allowing ecosystems and wildlife habitats to thrive instead of being cleared for agriculture.</p> <p>Donating food ensures the water used to grow food is not wasted. Each kilogram donated ensures that 8.5 m³ of water is not used in vain. That is equivalent to 65 days' worth of daily water use for a person in many countries based on daily water use of 150 litres^{xvii}. This contributes to conserving freshwater resources which are under increasing global pressure.</p> <p>Food waste in landfills decomposes and releases methane, a potent greenhouse gas. Donating food prevents this and reduces the overall carbon footprint. Research has found that net result of food donation provided nearly twice the climate benefit of anaerobic digestion (-0.40 vs. -0.22 kg CO₂e/FU)^{xviii}. Estimates indicate that each kilogram of food donated avoids 5 kg CO₂e. That is the same emissions as a 14km car journey. Donations help reduce emissions that drive climate change, showing how food rescue supports cleaner air and a healthier planet.</p>

Alongside these positive benefits^{xix}, food donation also incurs costs^{xx}. It requires sufficient physical and organisational infrastructure and procedures for good governance of donations to ensure optimal food availability and to ensure food safety. There can be logistical challenges in collecting, storing, and distributing donated food, and some organisations might be hesitant to donate food due to concerns about its freshness or potential spoilage and also liability for food risks. In response, and as part of its Circular Economy Action Plan, the European Commission has adopted EU food donation guidelines to facilitate the safe recovery and redistribution of edible food to those in need^{xxi}. These were developed in consultation with the EU Platform on Food Losses and Food Waste, and provide useful guidance on health and safety requirements, but do not address sustainability impacts from donation. As a result, more granular work with robust data from retailers is needed to provide data surety for the figures and estimates identified. Sustainability data must take an equal footing in integrated and holistic reporting, from large mainstream supermarkets to small independent traders. It was envisaged that CSRD would provide the mandatory impetus for data sharing, but the future progress of this is now uncertain.

5.2. FSI food supply actors

While it has not been possible, during the CULTIVATE SIA process to date, to gain verifiable data on donations from large supermarkets, we had more success when engaging small, local independent stores in the hub cities that did not have extensive hierarchical chains of command for decision-making. Crucially, these actors had access and permission to share data regarding food handled, food wasted, and food redistributed, along with other sustainable practices. These independent retail actors make up a diverse food business ecosystem offering choice and benefits beyond mainstream stores and often have a clear sustainability motivation for their operations. One retailer in each hub UPU location was engaged (see Table 5), and each business completed an SIA supported by the CULTIVATE team.

Table 5 Hub UPU location retailer case studies

UPU Location	Retail type	Description	Key features
Barcelona	Independent co-operative	Member-owned grocery co-op prioritising local and organic.	<ul style="list-style-type: none"> • Sustainable sourcing • Agroecological products
Utrecht	Community Supported Agriculture (CSA)	Weekly produce boxes are collected from a community hub. Subscription model.	<ul style="list-style-type: none"> • Diverts edible surplus from landfill • Networked with other sustainable food systems organisations
Milan	Social enterprise	Community shop, preserving lab and kitchen	<ul style="list-style-type: none"> • Provides community classes, training, and spaces. • Operates an inclusive governance model.

Each of these retailers creates and supports a range of sustainability impacts. The high-level impacts are summarised in Table 6 below:

Table 6 Key retailer impacts in hub UPU locations

City/Retailer	Social	Economic	Environmental
Barcelona Co-op	<ul style="list-style-type: none"> • 621 co-op members • 235 volunteers • Donates 75% of unsold food • Connects with two SFR initiatives 	<ul style="list-style-type: none"> • Discounts 95% of products before expiration. • Low total fresh food waste: 0.37% 	<ul style="list-style-type: none"> • 75% local food; 80% organic • 0.37% food unsold compared to 0.8% for large supermarkets • Unsold food that cannot be redistributed is composted
Utrecht CSA	<ul style="list-style-type: none"> • Partners with farmers, directly connecting people to food producers • Engages student volunteers • Network of SFSC advocates 	<ul style="list-style-type: none"> • €3,066 food waste costs avoided • Uses second-grade food produce to reduce food waste • Provides entrepreneurial foundation for hub operators 	<ul style="list-style-type: none"> • 1804 kg of food saved from waste • 2,342,6 kg in CO₂e • 90% locally sourced food • 30% organic produce
Milan SE	<ul style="list-style-type: none"> • Provides community space • Runs educational events for women • Training and job creation • Language courses • Social inclusion programmes 	<ul style="list-style-type: none"> • €268 food waste costs avoided • Sources hyper-locally providing economic benefit through the multiplier effect^{xxii} 	<ul style="list-style-type: none"> • Prevents 36.5 m² of new land from being used to grow food • Saves 620.5 m³ of water • 368 kg CO₂e emissions

These small-scale, community-focused initiatives harness significant impacts from limited resources, being agile, and deeply embedded in their communities. The impacts outlined in the table above demonstrate that these enterprises generate significant social value by leveraging social capital and operational flexibility, while providing tangible, transformational outcomes to individuals on a hyper-local scale. The power of these small-scale food actors is not easily quantified, although studies corroborate our findings that the social fabric that they create through networking, resilience, and community identity provides an informal social infrastructure that is often overlooked by policy^{xxiii}. Though sometimes precarious financially, these community-rooted entities play a crucial part in creating more resilient, equitable and sustainable urban food systems and should not be overlooked as essential actors in future food policy and planning.

6. Conclusion

This briefing note sets out estimated sustainability impacts of food sharing initiatives (FSIs) at the UPU scale, combining data from sustainability impact reporting with the results of FSI mapping in Milan, Barcelona and Utrecht. This formative impact analysis demonstrates the nature and scope of sustainability impacts across different types and scales of FSIs. The accuracy of these estimations will improve as sustainability reporting practices become embedded within FSIs and when the number of SIA reports increases. Nonetheless, it is clear that FSIs create valuable impacts across all four pillars of sustainability: social, environmental, economic and governance. In sum, establishing accurate sustainability impacts requires: Mapping the location, form and function of FSIs; identification of the scale of FSI activity; and data availability to evidence impacts relative to initiative goals.

From the research underpinning this briefing note, it is clear that once established, the impacts of FSIs are affected by a range of *internal* factors, including but not limited to:

- The resources required to maintain the initiatives' activities that create impact
- The skills and capacity to engage in data gathering and impact reporting to document impacts
- The level of interaction and support provided by similar and related organisations to share experiences and learning

Impact is also shaped by *external* factors, including but not limited to:

- The policies that affect sharing activities, which may be municipal, national and supra-national such as EU food waste reduction targets
- The particular mode of governance adopted by governing authorities and the extent to which FSIs are included within planning and decision-making processes
- The levels of citizen engagement with FSIs, which itself depends on awareness that FSIs exist, that FSIs meet the needs of citizens and that citizens are interested and able to engage with the FSIs

The CULTIVATE project is supporting FSIs, municipalities, food supply actors and citizens to work collectively towards optimising the sustainability impacts deriving from food sharing. These supports are illustrated in Figure 2:

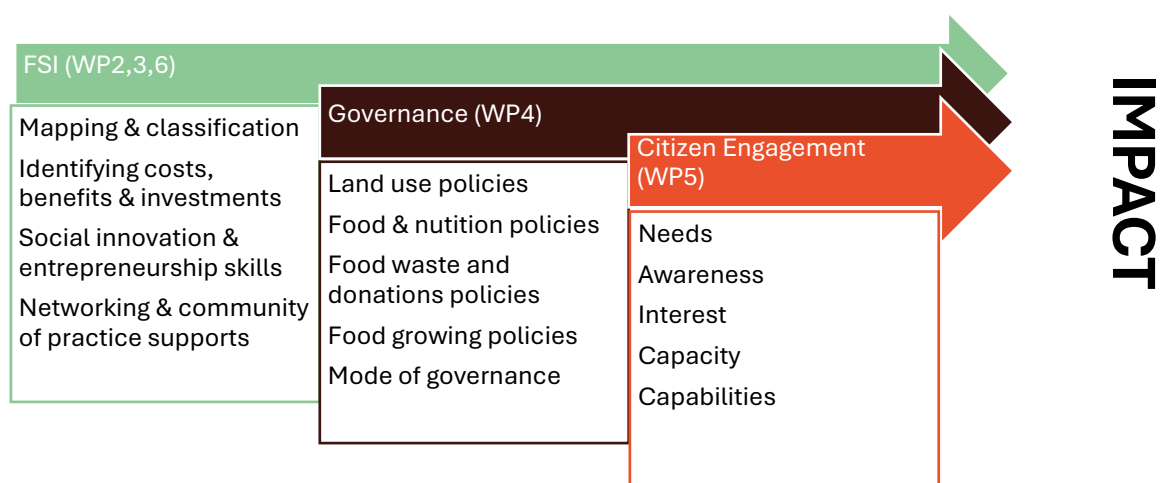


Figure 2 FSI impact pathway supports provided by the CULTIVATE project

6.1. Recommendations

The data presented in this briefing note marks the first step in establishing sustainability impacts from FSIs in UPU areas. Despite its small sample size, it nonetheless represents the most comprehensive dataset available to date on FSI sustainability impacts in UPU areas internationally. There are several future steps to improve the accuracy and comprehensiveness of estimating sustainability impacts from this sector:

- Expand the number of FSIs undertaking sustainability reporting through the Toolshed. This will be done in the replication phase of the CULTIVATE project with Spoke cities Brighton, Dublin, Athens, Freiburg, Brno and Lisbon, and all members of the CULTIVATE's expanded FSI Community of Practice (approximately 99 FSIs) will be invited and supported to complete SIAs.
- Establish key indicators for each type of FSI that might function well as proxies for scale for use with CULTIVATE mapping tools, for example with growing FSIs this might be size of community garden or number of active members; for cooking and eating initiatives this might be the number of meals served, and for SFR initiatives this could be the weight of food redistributed. Explore ways to 1) quickly identify these proxy indicators for the scale of FSIs and 2) test the efficacy and usability of these proxies with a sample UPU area.
- Establish confidence interval levels for small sample SIA datasets to communicate statistically the status of the estimates presented.
- Repeat UPU scale scenarios annually to explore changes in estimated impacts over time to feed into policy review and development processes.
- Consider the impact of quantifying contributions to the SDGs at the UPU scale in consultation with UPU policy officers and develop locally-relevant metrics.

The information provided by the estimated SIA at the UPU scale can be used in multiple ways. For municipalities, it can be used to evaluate provision across the different sectors of food sharing and to benchmark provision in these sectors against international comparators. More broadly, the data can be used to detail contributions to SDGs and highlight areas where more investments, supports or collaborations are needed to optimise transitions to more sustainable and resilient UPU areas.

Appendix 1 | Sizing of FSIs

To contextualize the sustainability impacts generated by food sharing initiatives (FSIs), it is essential to understand their scale and capacity. Traditional business definitions of size are not applicable to FSIs due to their unique nature, often being small, volunteer-only organizations or social enterprises. The table below illustrates the approach adopted for categorising FSIs by size. This approach considers whether the initiative is solely volunteer-run or employs staff, as well as the level of economic support it receives.

Table 7 FSI Sizing approach

FSI size	Micro	Small	Medium	Large
Full time employees	0	0	1	1
Part time employees	0	1	1	1
Volunteers only	1	1	0	0
Staff Headcount (employees plus volunteers)	<10	10 to 20	20 to 30	> 30
Local authority support	1	1	1	1
Grants received	0	1	1	1
Investments taken	0	0	1	1
Additional income streams (i.e., sales)	0	0	1	1



Appendix 2 | Impact areas and indicator categories

The Toolshed SIA platform contains a suite of indicators collated under a set of impact areas for each pillar of sustainability as shown on the table below. The indicators used in this report are in bold and were those most commonly reported on by FSIs in the sample.

Table 8 Impact areas and indicator categories

Pillar	Impact Area		Indicator
Social	Community Integration and sharing	1	Increasing appreciation of differing cultures across and within communities
		2	Improving communication skills
		3	Fostering a wider food and sharing culture
	Access and affordability of food	4	Increased access to and consumption of fruit and vegetables
		5	Increased access to and consumption of fresh food
	Health and wellbeing	6	Connecting and creating new support networks within communities
		7	Boosting levels of meal-sharing
		8	Increasing wellbeing through volunteering
		9	Improving self-confidence and resilience
		10	Increasing movement and exercise
		11	Increasing access to health and wellbeing services
	Education	12	Thinking about issues beyond price when buying food
		13	Increasing engagement in growing food
		14	Increased confidence and participation in cooking
		15	Discovery of new fresh foods
Environmental	Agricultural practices	16	Diverting organic waste from landfill
		17	Water recovery
		18	Maintaining and improving soil quality
		19	Maintaining and improving biodiversity
	Food waste	20	Food waste reduction
	Carbon Footprint	21	Reducing the carbon footprint of the food system
	Education	22	Increasing preference for vegetarian meals
		23	Reducing food packaging
Economic	Jobs	24	Training & Jobs
		25	Fairly paid work
	Local food production	26	Contribution to local food production
	Affordability of food	27	Reducing pressure on food budgets
	Education	28	Sharing specific skills and knowledge about the food system
		29	Formal qualifications
Governance	Civic engagement	30	Contributing to policy development
		31	Sharing knowledge and good practice
	Strategic planning	32	Strategic planning and sustainability
		33	Stakeholder engagement
	Risk control	34	Risk control



Appendix 3 | Impact assessment at urban and peri-urban scale (aggregate table)

This table shows the key indicators that were used for the UPU scale assessment along with the average data for that indicator at an individual FSI scale. This figure is multiplied by the number of relevant FSIs in that area to create UPU scale estimations.

[Appendix 2](#) details the full list of sustainability pillars, impact areas and indicators.

Table 9 Average impacts applied at the UPU scale

Type	Indicator (indicator number)	Unit	Average (individual FSI scale)	Milan (UPU scale)	Utrecht (UPU scale)	Barcelona (UPU scale)
Growing	Contribution to food production (26)	Tonnes	12	427	465	985
	Reducing the carbon footprint of the food system (21)	t CO ₂ e	35	13	14	30
	Reducing pressure on food budgets (27)	€	36739	1,348,322	1,469,561	3111795
Cooking & Eating	Boosting levels of meal sharing (7)	Meals shared	1883	59702	52733	86068
	People accessing healthy food (5)	Individuals	12087	383147	338427	552361
Redistribution	Food waste reduction (20)	Tonnes	208	8051	4993	18869
	Reducing the carbon footprint of the food system (21)	t CO ₂ e	665.74	25764	15978	60382
General	Educational experiences (12,13,14,15,16,19,20,22,23,24,27,29,31)	Events	1,509	161,427	138,797	333,415
	Increased wellbeing through volunteering (8)	Individuals	66	7,080	6,087	14,623

Numbers in brackets refer to the number of the indicator in [Appendix 2](#)

Appendix 4 | Sustainability impact assessment summary report example

SIA reports contain a number of elements. This appendix provides an illustration of these elements drawn from anonymised FSI SIA reports:

(a) Alignment with the SDGs. The user receives an automatic report with graphics linking their impact data points to the Sustainable Development Goals. The figure below shows which goals they contribute to and whether they make a major direct impact, a direct impact or contribute to the ethos of the goal based on the data they reported. FSIs at the beginning of their impact reporting journey may not have data to evidence all the impacts that they create. Support for FSIs to expand their reporting practices is provided by the [Sharing Solutions](#) platform.



Figure 3 SIA alignment with the SDGs

(b) Impacts created by collaborative acts of food sharing. Toolshed reports specifically highlight benefits which are created through sharing. Each indicator question is assigned to one (or more) of eight categories: Community Benefits, Individual Benefits, Environmental Enhancement, Efficient Resource Use, Money Saving, Money Making, Internal Governance, and External Governance. When FSIs report data related to these indicators, they are assigned a 'Sharing Star'.



Figure 4 Example of "Food Sharing Benefits" from an SIA summary report

(c) **Impact wheel and highlights.** On completion of the Toolshed SIA, an impact wheel is created which shows the direct and indirect impacts being reported allied to the four pillars of sustainability. The FSI can select the three indicators that illustrate their key areas of impact.

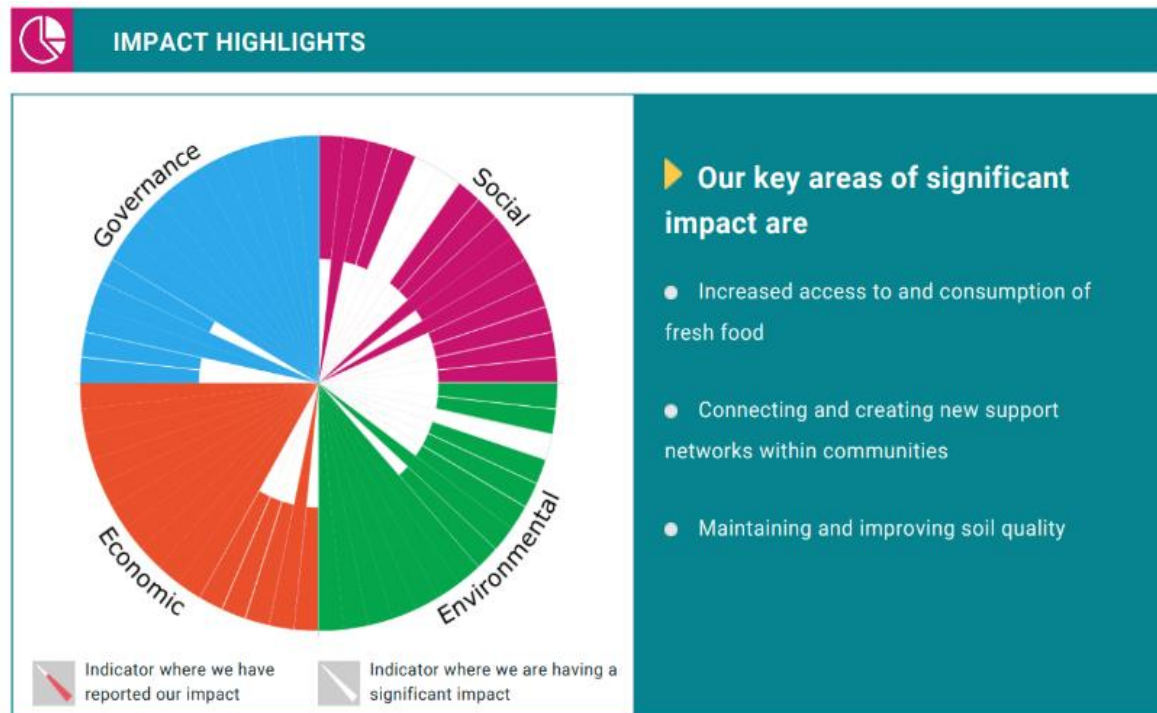


Figure 5 Example of "Impact highlights" from an SIA summary report

Endnotes

-
- ⁱ Dean Phelan, Anna Davies, and Nicoletta Gomboli. “*The European Food Sharing Dictionary*”. Zenodo, November 28, 2023. <https://doi.org/10.5281/zenodo.10160274>.
- ⁱⁱ Anna Davies, Hyunji Cho, Ana-Maria Gatejel, Roberto Martinez Varder, and Marco Vedo. “*CULTIVATE Briefing Note - Food Sharing Landscapes in Hub City Locations*”. Zenodo, April 12, 2024. <https://doi.org/10.5281/zenodo.11030355>.
- ⁱⁱⁱ Stephen Mackenzie and Anna Davies. “SHARE IT: Co-designing a sustainability impact assessment framework for urban food sharing initiatives”. *Environmental Impact Assessment Review*, 79, 106300. <https://doi.org/10.1016/j.eiar.2019.106300>
- ^{iv} Stephen Mackenzie and Anna Davies. “Assessing the sustainability impacts of food sharing initiatives: User testing The Toolshed SIA.” *Frontiers in Sustainable Food Systems* 6 (2022): 807690. <https://doi.org/10.3389/fsufs.2022.807690>
- ^v Konstantin Kühle and Reiner Quick, “The impact of corporate governance statement assurance on financial professionals’ decisions.” *Accounting in Europe* 22, no. 1 (2025): 18-50. <https://doi.org/10.1080/17449480.2024.2332390>
- ^{vi} United Nations Environment Programme (UNEP). *UNEP Food Waste Index Report 2021*. Nairobi: United Nations Environment Programme, 2021. <https://www.unep.org/resources/report/unep-food-waste-index-report-2021>.
- ^{vii} Anna Davies, Hyunji Cho, Ana-Maria Gatejel, Roberto Martinez Varder, and Marco Vedo. “*CULTIVATE Briefing Note - Food Sharing Landscapes in Hub City Locations*”. Zenodo, April 12, 2024. <https://doi.org/10.5281/zenodo.11030355>
- ^{viii} Monika Rut and Anna R. Davies. “Food sharing in a pandemic: urban infrastructures, prefigurative practices and lessons for the future.” *Cities* 145 (2024): 104609. <https://doi.org/10.1016/j.cities.2023.104609>
- ^{ix} European Commission, “Food Waste Reduction Targets,” *EU Actions Against Food Waste*, last modified (or accessed) June 19, 2025, https://food.ec.europa.eu/food-safety/food-waste/eu-actions-against-food-waste/food-waste-reduction-targets_en.
- ^x United Nations Environment Programme, *Food Waste Index Report 2024* (Nairobi: United Nations Environment, 2024), https://unstats.un.org/unsd/envstats/fdes/EGES11/9UNEP_Food%20Waste%20Index.pdf.
- ^{xi} Eurostat. *Food waste and food waste prevention by NACE Rev. 2 activity – tonnes of fresh mass (env_wasfw)*. (Luxembourg: European Commission, 2024). https://doi.org/10.2908/ENV_WASFW
- ^{xii} Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 on corporate sustainability reporting, *Official Journal of the European Union* L 322 (16 December 2022): 15–43, <https://eur-lex.europa.eu/eli/dir/2022/2464/oj/eng>.
- ^{xiii} Ibid.
- ^{xiv} Laura Garcia Herrero, Cecilia Casonato, Carla Caldeira, Valeria De Laurentiis, Hendrik Bruns, and Serenella Sala, “Scoping consumer food waste: an evaluation framework of prevention interventions”, Publications Office of the European Union, Luxembourg, 2023, <https://doi.org/10.2760/3128> JRC128763.



^{xv} Valeria De Laurentiis, Carla Caldeira, & Serenella Sala. “No time to waste: Assessing the performance of food waste prevention actions. *Resources, Conservation and Recycling*, 161. 2020. <https://doi.org/10.1016/j.resconrec.2020.104946>

^{xvi} FareShare, *FareShare*, accessed June 20, 2025, <https://fareshare.org.uk/>.

^{xvii} Eurostat. 2024. “Water Statistics.” *Statistics Explained*. July 2024. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Water_statistics#:~:text=Table%20%20presents%20households'%20water,decreasing%20over%20the%20last%20decades

^{xviii} Niina Sundin, Christine Persson Osowski, Ingrid Strid, & Mattias Eriksson. “Surplus food donation: Effectiveness, carbon footprint, and rebound effect”. *Resources, Conservation and Recycling*, 181, 2022, 106271. <https://doi.org/10.1016/j.resconrec.2022.106271>

^{xix} Yuliya Voytenko Palgan, Vera Sadovska, Oksana Mont, and Andrius Plepys. “Costs and Benefits of Food Sharing in Barcelona”. Zenodo, March 2025. <https://doi.org/10.5281/zenodo.15006302>.

^{xx} Vera Sadovska, Oksana Mont, and Yuliya Voytenko Palgan. “Exploring economic challenges and costs of food-sharing initiatives”. In *Understanding the Urban Sharing Economy*, (Cheltenham, UK: Edward Elgar Publishing, 2025) <https://doi.org/10.4337/9781035320547.00018>

^{xxi} Council of the European Union, *Council Recommendation of 20 November 2017 on the European Pillar of Social Rights*, *Official Journal of the European Union* C 361 (13 December 2017), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.C_.2017.361.01.0001.01.ENG.

^{xxii} Benedek, Zsófia, Imre Fertő, and Viktória Szente. 2020. “The Multiplier Effects of Food Relocalization: A Systematic Review” *Sustainability* 12, no. 9: 3524. <https://doi.org/10.3390/su12093524>

^{xxiii} Quilloy, Karen, Alexander Newman, and Amanda Pyman. “Antecedents of the social impact of social enterprises: A systematic review and agenda for future research.” *Nonprofit and Voluntary Sector Quarterly* 53, no. 3 (2024): 689-715. <https://doi.org/10.1177/08997640231191794>