



## About the GRAINS project:

**Project name: Greening Agrifood in Social Economy**

**Project acronym: GRAINS**

**Call: SMP-COSME-2022-SEE**

**Type of action: SMP Grants for Financial Support (Budget based / Action grant)**

**Project number: 101127575**

**Granting authority: European Innovation Council and SMEs Executive Agency**

**Project starting date: 1 October 2023**

**Project end date: 31 September 2025**

**Project duration: 24 months**

The GRAINS project aims to address:

- the challenges faced by SMEs in agrifood by providing training on sustainable practices and on how to reduce their environmental footprint.

The GRAINS project supports:

- capacity building
- knowledge transfer, and cooperation among social economy SMEs in the agri-food sector



## Description of the WP2:

### Objectives:

- The capacity building courses enable social economy SMEs to use input-based, new digital technologies, knowledge-based, and organizational innovations for green purposes resulting in new business models to improve their productivity, income, and climate resilience in the long term (1st year)
- The capacity-building courses aims at boosting the uptake of sustainable economy practices and enabling the development of local green markets (2nd year)

Four capacity building activities were organised in the second year of the project:

The four capacity building events organised in the second year were:

- Eco packaging and unpacking – CRIS (online) (27 November 2024)
- Taste the waste - how does food waste occur; how can we prevent it and what is its ecological footprint? – innova eG (online) (29 January 2025)
- Hands-On Biodiversity – innova eG (online) (27 March 2025)
- Local markets – AGCI (online) (27 May 2025)



# GrAins

Greening Agrifood  
in Social Economy



Co-funded by  
the European Union



# Greening Agrifood in Social Economy

Capacity building on Greening Agrifood in Social Economy

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## Eco packaging and unpacking

### TRAINING MATERIAL

Date: 27 November 2024

Venue: online (Zoom)

Training number: GAINS WP2-CB / 5

Training provider: CRIS



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## Disclaimer

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

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## Abbreviations

|       |                                                        |
|-------|--------------------------------------------------------|
| CAP   | Common Agricultural Policy                             |
| EAFRD | European Agricultural Fund for Rural Development       |
| EC    | European Commission                                    |
| ECHA  | The European Chemicals Agency                          |
| EPR   | Extended Producer Responsibility                       |
| EPRS  | European Parliamentary Research Service                |
| EU    | European Union                                         |
| FAO   | Food for Agriculture Organization                      |
| OECD  | Organization for Economic Co-operation and Development |
| PPWD  | Packaging and Packaging Waste Directive                |
| SE    | Social Economy                                         |
| SEOs  | Social Economy Organizations                           |
| SME   | Small and Medium-size Enterprise                       |
| UNIDO | United Nations Industrial Development Organisation     |
| VCM   | Controlled Mechanical Ventilation                      |
| WFD   | Water Framework Directive                              |

# 1. Green Deal and Circular Economy

## 1.1 Introduction

The European Green Deal provides the roadmap to achieve an extensive transformation across all aspects of society, facing major environmental, economic, and social challenges.<sup>1</sup> Sustainability plays an increasingly important role, and packaging pressing need to upgrade to meet certain requirements.

Traditional packaging designs were largely developed with a linear economy model in mind, where products are created, used, and then discarded. This model relies on a "take-make-dispose" approach, prioritizing convenience and cost-effectiveness over environmental considerations. Packaging materials, often made from single-use plastics or non-recyclable composites, have been designed for durability and protection during transport, with little thought given to what happens to the materials after use.

In this framework, waste generation was simply a by-product of the process, with limited focus on reusing, recycling or biodegrading. The linear economy thrives on constant resource extraction and waste accumulation, leading to issues such as landfill overflow, environmental pollution, and resource depletion.

In recent years, however, there's been a shift towards a circular economy. This model promotes sustainable packaging by considering the entire life cycle of a product, focusing on designing for reuse, recycling, and resource efficiency. New packaging designs aim to minimize waste, use renewable or recycled materials, and facilitate easy recycling, all of which help close the loop and reduce the impact on the environment.

Nowadays, instead, packaging should be sustainable, therefore realised in a circular economy perspective in which waste production is limited as much as possible. The circular economy is a production and consumption model that involves sharing, lending, reusing, repairing, reconditioning and recycling existing materials and products for as long as possible.<sup>2</sup>

In November 2022<sup>3</sup> the European Commission (EC) proposed new EU-wide rules on packaging. These include a proposal to improve the design of packaging, provide it with clear labelling and encourage reuse and recycling. The proposal also includes a transition to bio-based, biodegradable and compostable plastics. Preventing packaging waste, increasing reuse and refill, and making all packaging recyclable are the targets by 2030.

The circular economy model fundamentally rethinks traditional consumption patterns. Rather than following the linear approach of taking, making, and discarding, it emphasizes keeping products and

<sup>1</sup> European Commission (n. d.) Research and innovation for the European Green Deal. Available at [https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/environment-and-climate/european-green-deal\\_en](https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/environment-and-climate/european-green-deal_en). Accessed 13 October 2024

<sup>2</sup> European Commission, Circular economy: definition, importance and benefits <https://www.europarl.europa.eu/topics/en/article/20151201STO05603/circular-economy-definition-importance-and-benefits#:~:text=The%20circular%20economy%20is%20a, reducing%20waste%20to%20a%20minimum.>

<sup>3</sup> European Commission. (2022). European Green Deal: Putting an end to wasteful packaging, boosting reuse and recycling Available at: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_7155?fbclid=IwAR17DTjpv2Z22Wf8tQ73xYvoQ7yjuvXVeT8kZhrYDEri9eMkrz4XJrS-eAA](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7155?fbclid=IwAR17DTjpv2Z22Wf8tQ73xYvoQ7yjuvXVeT8kZhrYDEri9eMkrz4XJrS-eAA) Accessed: 13 October 2024

materials in use for as long as possible. By prioritizing activities like sharing, lending, reusing, repairing, reconditioning, and recycling, the circular economy reduces waste, conserves resources, and creates a regenerative system.

In this model, resources are cycled back into the economy, either by maintaining the original product's use or transforming its components into new products. This not only reduces the need for new materials but also diminishes the environmental impact associated with production and disposal. Businesses and consumers alike are encouraged to maximize the value of resources, shifting away from ownership towards access-based models.

The circular economy ultimately aims to design waste and pollution out of the equation, promote sustainability, and ensure that resource consumption aligns with the planet's ecological boundaries. It's a holistic, forward-looking model that emphasizes both economic and environmental resilience. The Commission is proposing new EU-wide rules on packaging, to tackle this constantly growing source of waste. On average, each European generates almost 180 kg of packaging waste per year<sup>4</sup>. Packaging is one of the main users of virgin materials as 40% of plastics and 50% of paper used in the EU is destined for packaging. Without action, the EU would see a further 19% increase in packaging waste by 2030, and for plastic packaging waste even a 46% increase.<sup>5</sup>

The overall objective of the EU legislative proposal<sup>6</sup> (2021) is to reduce the negative environmental impacts of packaging and packaging waste for the EU market. Specifically, the proposal aims to:

1. reduce the generation of packaging waste;
2. promote a circular economy for packaging in a cost-effective manner;
3. promote the uptake of recycled content within packaging.

The proposal introduces new rules regarding packaging placed on the EU market, specifically:

- **Recyclability:** all packaging placed on the market will have to be recyclable. The recyclability of packaging will be measured on a scale from A to E, where E corresponds to packaging that is not recyclable and therefore banned from the market.
- **Reusability:** all packaging placed on the market will have to be designed and used in such a way that it can be reused as many times as possible. Economic operators placing reusable packaging on the market will have to ensure that there is a system in place to reuse it. Furthermore, certain single-use packaging will be explicitly prohibited (e.g. single-use

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<sup>4</sup> <https://ewwr.eu/new-potential-measures-on-packaging-and-packaging-waste-in-europe/>

<sup>5</sup> European Commission. (2019). Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, and the Committee of the Regions- The European Green Deal. European Commission. Available at [https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea8c1f-01aa75ed71a1.0002.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF). Accessed: 13 October 2024

<sup>6</sup> <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-new-circular-economy-action-plan>

packaging for fresh fruit and vegetables, as well as miniature single-use packaging such as shampoo bottles).

- **Dimensions:** each packaging unit shall be reduced to the minimum dimensions in terms of weight and volume. It must be ensured that the empty space ratio does not exceed 40% of the total volume of the packaging.
- **Use of recycled content:** the plastic parts of the packaging shall contain a specified proportion of recycled content recovered from post-consumer plastic waste for each packaging unit.

Furthermore, regarding recyclability and reusability, it will become mandatory to affix:

- **Harmonised European symbols** on bins and packaging to indicate sorting, as well as on packaging to indicate reusability. This includes the obligation to add, by 1 January 2028, labels enabling the separate collection of each material.
- **QR codes** to be added to packaging to provide consumers with more information on the reusability of product packaging and to indicate collection points for recycling.

This extends the life cycle of products, helping to minimise waste. Once the product has completed its function, the materials from which it is made are in fact reintroduced, where possible by recycling. Thus, they can be continuously reused within the production cycle, generating further value.

## 1.2 What is packaging?

The functions of packaging are several:

1. to protect the product from damage during transport and distribution;
2. to provide product information such as ingredients, instructions for use, etc.,
3. to attract the consumer's attention
4. to promote the product.

The materials used for packaging can be made of different materials, such as paper, plastic, metal or glass, depending on the nature of the product and the needs of the consumer.

Packaging has a significant impact on the environment, both during production and disposal.

The production of packaging materials, such as plastic, requires large amounts of energy and generates polluting emissions. In addition, much packaging is not biodegradable and can take hundreds of years to decompose. Once products have been used, packaging becomes waste. Packaging materials, particularly plastic, have significant environmental costs. The production process for plastic packaging is energy-intensive, typically relying on fossil fuels. This not only contributes to greenhouse gas emissions but also depletes natural resources. Additionally, most

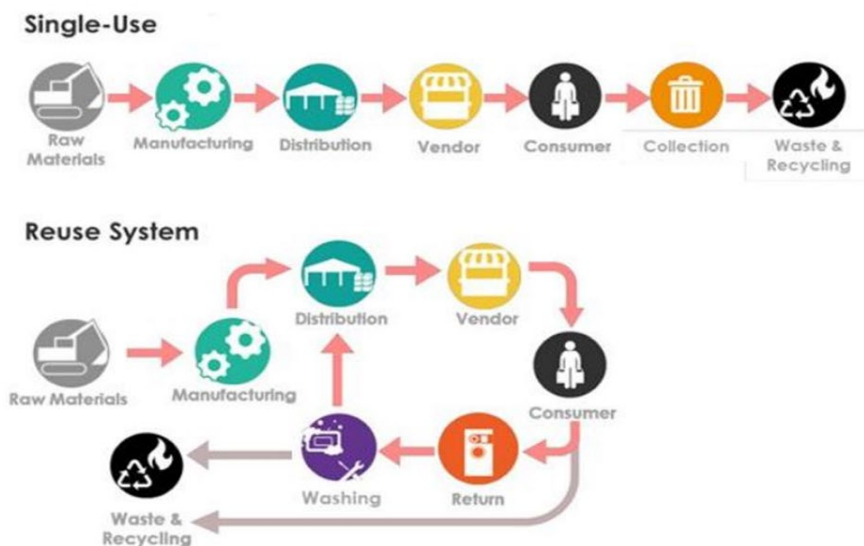
conventional plastics are non-biodegradable, meaning they can persist in the environment for hundreds of years, accumulating in landfills, oceans, and other natural ecosystems.

When disposed of, plastic waste can cause serious ecological damage. In oceans, for instance, it endangers marine life, as animals may ingest plastic particles or become entangled in larger debris. On land, plastic waste can contaminate soil and waterways, releasing toxic substances as it breaks down, which can affect both wildlife and human health. With this growing environmental awareness, there is a shift toward more sustainable packaging solutions. Biodegradable materials, recycled content, and alternative materials like paper, glass, or bioplastics are increasingly in demand. Similarly, innovations in packaging design are aiming to reduce material use and improve recyclability. For consumers and industries alike, reducing packaging waste is now seen as a critical component of broader sustainability efforts.

In recent years, to reduce the environmental impact of packaging, several tricks have been developed, such as choosing to use more sustainable packaging materials, such as: recycled cartons or biodegradable plastic.

It would also be important to reduce the amount of packaging used, for example by using reusable water bottles instead of single-use bottles.

Finally, good waste management can help to reduce the environmental impact of packaging. This includes the separate collection and recycling of packaging, as well as promoting the use of recycled packaging. It must include the promotion of sustainable practices in the production and disposal of packaging, and the adoption of policies that encourage the use of more sustainable materials and technologies.



**Figure 1: Lifecycle of Single-use Model and Reuse Packaging System**

Source: Eunomia, Zero Waste Europe: <https://zerowasteurope.eu/library/decarbonisation-of-single-use-beverage-packaging/>

### 1.3 The green packaging

The shift toward green or sustainable packaging in Europe has been largely influenced by various European Union (EU) standards and regulations. The EU has implemented policies under its European Green Deal, Circular Economy Action Plan, and EU Packaging and Packaging Waste Directive, which encourage companies to adopt more sustainable packaging solutions. These policies target both the production and disposal phases of packaging, with goals to reduce waste, increase recyclability, and promote the use of biodegradable or renewable materials. The directive mandates that companies minimize packaging materials, use recyclable or compostable options, and reduce environmental impact through product life cycle assessment.

Many companies, both large and small, across various industries have responded to these standards by incorporating sustainable practices. All reflect the widespread adoption of green packaging as a response to EU standards and the push toward a circular economy across Europe.

As a result of the European standards, green packaging, also known as sustainable packaging, has been introduced. It is, indeed, a practice that seeks to reduce the environmental impact of packaging on the Earth. It focuses on using more sustainable materials and technologies, as well as reducing the use of materials and increasing the recycling and reuse of packaging. One of the main aspects of green packaging is the use of sustainable materials, i.e. the use of recycled materials, such as recycled cardboard, and biodegradable materials, such as cellulose and corn stool. In addition, there is an attempt to use materials with a low environmental impact, such as glass and aluminium, which can be easily recycled. In parallel to the use of sustainable materials, green packaging also focuses on reducing the use of materials. This can be achieved by designing products and packaging to reduce the volume and weight of packaging. In order to do this, efforts are also made to use modular packaging that can be easily disassembled and reassembled, which reduces the quantity of materials used.

The standard UNI EN 13432:2002 '**Requirements for packaging recoverable through composting and biodegradation**' was created to fill some legislative gaps left by the previous directive 94/62/EC.<sup>7</sup> Indeed, the European directive could be interpreted by individual legislators with the risk of generating misunderstandings or improper use of terms, especially the terms compostable and biodegradable. The actual definitions<sup>8</sup> are:

- **Biobased:** points to the raw materials, or feedstock, used for their production. While conventional plastics are made from fossil resources (oil and natural gas), biobased plastics are made from biomass. The biomass currently originates mainly from plants grown specifically to be used as feedstock to substitute fossil resources, such as sugarcane, cereal crops, oil crops or non-food sources like wood. Other sources are organic waste and by-

<sup>7</sup> Legislative barriers for the recycling of fossil and biobased plastics for packaging, 2018.

<sup>8</sup> European Union (2022). Synopsis report on the consultation on the policy framework on biobased, biodegradable and compostable plastic (2022) Luxembourg, for more details, see: [https://environment.ec.europa.eu/publications/communication-eu-policy-framework-biobased-biodegradable-and-compostable-plastics\\_en](https://environment.ec.europa.eu/publications/communication-eu-policy-framework-biobased-biodegradable-and-compostable-plastics_en)

products, such as used cooking oil, bagasse and tall oil. Plastics can be fully or partially made from biobased feedstock.

- **Biodegradable:** are designed to decompose at the end of their life by the conversion of all their organic constituents (polymers and organic additives) mainly into carbon dioxide and water, new microbial biomass, mineral salts and, in the absence of oxygen, methane.
- **Compostable plastics:** are a subset of biodegradable plastics designed to biodegrade under controlled conditions, typically through industrial composting in special facilities for composting or anaerobic digestion.

## 1.4 What is Circular Economy?

In February 2021, the European Parliament adopted a resolution on the new action plan for the circular economy, calling for additional measures to achieve a carbon-neutral, environmentally sustainable, toxic-free and fully circular economy by 2050. Stricter recycling standards and binding 2030 targets on material use and material footprint are also included.<sup>9</sup>



Figure 2. The Circular economy

Source: <https://repak.ie/driving-change/circular-economy-eu-legislation/>

<sup>9</sup> European Commission (2020.) Available at: <https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=CELEX:52020DC0098>

Circular economy refers<sup>10</sup> to an economy whose sole objective is to minimise waste and optimise the use of natural resources by designing, producing and reusing products. It is based on three principles:

1. **Combat pollution and reduce waste:** most of the environmental impact depends on the decisions made at the design stage. Waste and pollution can be reduced by favouring new technologies and innovative materials.
2. **Preserve materials and products** so that they can be reused: the reuse, repair and regenerate products.
3. **Regenerate natural systems:** by aiming to do good (instead of just trying to reduce damage), we can actively improve the environment for the benefit of ecosystems and the earth.

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<sup>10</sup> <https://circulareconomyforfood.eu/en/>

## 2. European Waste Framework Directive

### 2.1 Introduction

The European Union Waste Framework Directive “WFD” (2018/851) supports the broader [EU circular economy initiative](#), which aims to move the European economy toward sustainable production and consumption. On March 13<sup>th</sup>, 2024, the European Parliament approved its report on the EU WFD. This update of the WFD focuses on food and textile waste and carries significant novelties for both the companies producing waste as well as waste collectors. EU WFD proposes higher binding waste-reduction targets to be met at the national level by December 31st, 2030 - a reduction of at least 20% in food processing and manufacturing and a per capita reduction of at least 40% in retail, restaurants, food services and households.<sup>11</sup>

### 2.2 Packaging and Packaging Waste Directive

In September 2022, under the Environmental Implementation Review, the Commission assessed the state of play of the transposition of the Packaging and Packaging Waste Directive (PPWD). It pointed out that there were differences in circularity rates (i.e. the share of material recycled and fed back into the economy) between Member States, with a 13% average EU-level rate for secondary use of materials.

Waste prevention is a significant challenge across all EU Member States, even those with high recycling rates, such as Germany, Austria, and Belgium. Despite leading in recycling, these countries still face issues with overall waste generation. High recycling rates can sometimes mask the underlying problem of overconsumption and excessive waste production, as recycling alone does not fully address the environmental impacts of waste.

To address this, EU policies emphasize waste prevention through measures like:

- Eco-design: Encouraging companies to design products with fewer materials and longer lifespans.
- Promoting reuse: Supporting repair and refurbishment industries to extend product life.

Extended Producer Responsibility (EPR): Holding manufacturers accountable for the life cycle of their products, incentivizing reduced waste in production and packaging.

Countries with robust recycling systems are increasingly focusing on these waste prevention measures to reduce overall waste generation and move closer to a sustainable, circular economy.

On December 1st, 2022, European Parliamentary Research Service (EPRS) published an implementation appraisal on the operation of the PPWD.<sup>12</sup>

<sup>11</sup> Feedback to the proposal for a targeted revision of the Waste Framework Directive, available at: [https://zerowasteurope.eu/wp-content/uploads/2023/11/zwe\\_nov23\\_consultationresponse\\_WFDrevision.pdf](https://zerowasteurope.eu/wp-content/uploads/2023/11/zwe_nov23_consultationresponse_WFDrevision.pdf)

<sup>12</sup> [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/745707/EPRS\\_BRI\(2023\)745707\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/745707/EPRS_BRI(2023)745707_EN.pdf)



Figure 3. Waste hierarchy

Source: [https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive\\_en](https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en)

The PPWR adopted in Europe, pushes the distributors of take-away food and beverages to offer consumers a choice between reusable and disposable packaging. Starting in 2030, end distributors will commit to offer 10% of take-away food and beverages in reusable packaging. However, since the requirement is only a 'commitment' to do so, this is not a binding target. The PPWR also states that incentivising food and drink sellers to provide reusable packaging is a means of contributing to the EU packaging reduction targets (Member States are required to reduce the volume of packaging waste per capita by 5% by 2030, 10% by 2035 and 15% by 2040, based on 2018 levels).

The study *"Facilitating the Adoption of Takeaway Reuse Systems"*<sup>13</sup> by Eunomia Research & Consulting and Zero Waste Europe analysed the potential and practicality of implementing reusable packaging systems in the takeaway food sector. Here are some key findings and recommendations from the study:

- **Environmental impact reduction:** it found that takeaway reuse systems, such as reusable containers, can significantly reduce single-use packaging waste and overall environmental impact. Reusable packaging systems contribute to lowering greenhouse gas emissions and decreasing waste in landfills and natural environments, especially when they replace single-use plastics and other disposables.
- **Challenges in implementation:** it highlighted barriers to widespread adoption of reusable systems, such as logistical issues, initial financial investments, and consumer convenience. Concerns over hygiene and return logistics for containers were also noted as challenges that need to be addressed.

<sup>13</sup> Decarbonisation of Single Use Beverage Packaging (2023), Zero Waste Europe, Available at: <https://zerowasteurope.eu/library/decarbonisation-of-single-use-beverage-packaging/>

- **Economic and operational viability:** for reusable systems to be viable, the report suggests that business models should be adapted to accommodate reuse. This could include deposit systems for reusable containers, partnerships with third-party providers to manage cleaning and redistribution, and incentivizing customers to return containers.
- **Supportive policy measures:** it emphasized the need for supportive policy frameworks, such as financial incentives for businesses that adopt reusable systems and potential restrictions on single-use items to encourage a shift toward reuse. It also calls for standardized guidelines across the EU to ensure consistent implementation of reuse systems and streamline processes for businesses and consumers.
- **Consumer engagement and education:** consumer behaviour is a major factor in the success of reusable packaging. The study suggests that awareness campaigns and incentives can help educate and motivate consumers to participate in reusable container programs actively.

This study has been instrumental in demonstrating the benefits and potential of reusable takeaway systems and provides a roadmap for policymakers and businesses to implement such systems in a way that balances environmental, economic, and operational considerations.

Finally, the main points are:

1. The costs associated with six different formats of single-use take-away packaging systems in comparison with reusable ones, starting with two city case studies (Berlin and Aarhus).
2. The policy instruments that could encourage a higher market uptake of packaging reuse systems.

### Box 1. The case of Germany

The study of *Eunomia Research* mentioned how Germany has adopted fiscal policy measures on single-use packaging. Although it has been shown that EPR tariffs could result in lower costs for reuse packaging systems than for single-use systems, reuse systems have not yet achieved high levels of market penetration. Perhaps indicates that the impact of this type of tax intervention on vendor costs is insufficient to encourage high market penetration of reuse packaging systems. Several complementary measures that can encourage gradual changes need to be increased. These include:

- ✓ the choice of re-use as the default option for shop packaging;
- ✓ the setting of meaningful targets for re-use;
- ✓ the establishment of an outright ban on single-use packaging.

## 2.3 Plastic use and data

The first **Global Plastics Outlook** by the OECD states that, while population and income growth is driving a relentless increase in the amount of plastic used and thrown away, policies to curb the dispersal of plastic waste into the environment are insufficient. It is reported that world produces double the amount of plastic waste compared to two decades ago, most of which ends up in landfills, incinerated or dispersed in the environment and only 9% is successfully recycled.<sup>14</sup>

The report shows that almost half of all plastic waste is generated in OECD member countries (currently 38). Plastic waste generated per capita annually varies on average from 221 kg in the United States, to 114 kg in Europe and 69 kg in Japan and Korea. Behind the 14% leakage of plastic waste would be the OECD countries, which within this percentage would be responsible for 11% of macroplastics and 35% of microplastics.

The crisis generated by Covid-19 led to a 2.2% decrease in plastic use in 2020, due to the slowdown in economic activities, but an increase in waste, mainly attributable to packaging for take-away food and medical equipment such as masks. Plastic waste usage started to recover with the economic recovery in 2021. Most plastics in use today are virgin materials, obtained from fossil sources. Even though the global production of recycled materials has more than quadrupled from 2000 to 2019, from 6.8 to 29.1 million tonnes, this amount still only represents 6% of the total plastic production.<sup>15</sup>

**The European Chemicals Agency (ECHA)** identified risks from additives and the release of PVC microparticles, stating that regulatory action would be necessary. PVC is considered the most dangerous plastic because it has a huge impact on both the environment and health. It is produced from naphtha, natural gas or even coal, to obtain vinyl chloride monomer (VCM), which is a human

<sup>14</sup> Global Plastics Outlook. Policy Scenarios to 2060 (2022), Available at :[https://www.oecd.org/en/publications/global-plastics-outlook\\_aa1edf33-en/full-report.html](https://www.oecd.org/en/publications/global-plastics-outlook_aa1edf33-en/full-report.html)

<sup>15</sup> European Commission (2021), Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, Updating the 2020 New Industrial Strategy: Building a Stronger Single Market for Europe's recovery, COM (2021) 350 final.

carcinogen and which, despite improvements in production practices that have reduced its release, continues to be a concern because at the same time the amount of PVC produced has increased. There are efforts to replace the most dangerous phthalates with others of the same family, but these are still untested, so reducing the use of PVC remains a priority.

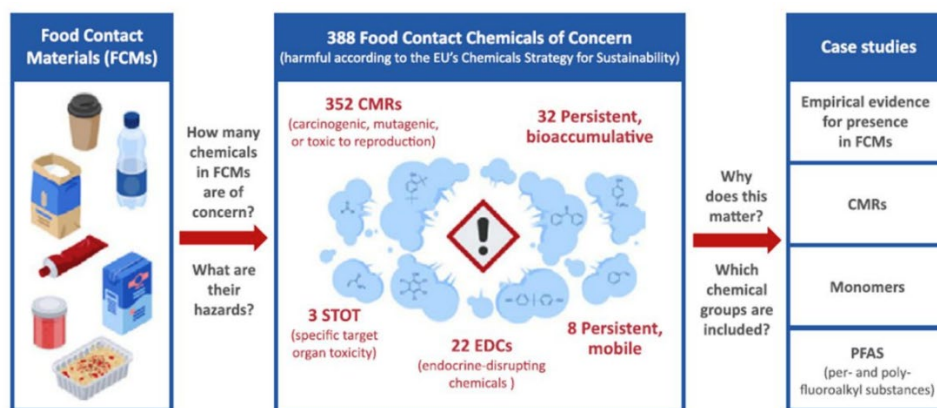


Figure 4. Chemical substances in packaging

Source: <https://www.sciencedirect.com/science/article/pii/S0304389422009578?via%3Dihub>

Eco-packaging, un-packaging, and the EU's Common Agricultural Policy (CAP) intersect as part of Europe's broader sustainability and environmental goals, especially regarding resource efficiency, waste reduction, and sustainable production.

### Eco-Packaging and CAP

Eco-packaging refers to packaging that minimizes environmental impact, using materials that are biodegradable, recyclable, or derived from renewable sources. CAP encourages sustainable agricultural practices and resource efficiency, which aligns with using eco-friendly packaging in food and agricultural products.

Through CAP's sustainability-focused funding mechanisms, the EU provides financial support for agricultural businesses that adopt sustainable practices, including environmentally friendly packaging. This funding can be used by farmers and producers to invest in eco-packaging solutions, thus reducing the environmental footprint of agricultural products as they reach consumers.

### Un-Packaging and CAP

Un-packaging refers to reducing or eliminating packaging entirely, often seen in bulk or zero-waste stores. CAP encourages the reduction of waste throughout the food supply chain, which includes reducing unnecessary packaging.

By reducing packaging at the source, agricultural businesses can contribute to CAP's goals of sustainability and waste reduction. CAP's framework for sustainable production incentivizes

practices that contribute to circular economy principles, which includes eliminating unnecessary packaging for products wherever possible.

### **CAP's Role in Supporting Eco-Friendly and Un-Packaging Practices**

CAP's current reform emphasizes environmental sustainability, with direct funding support for initiatives that contribute to the European Green Deal's goals. These initiatives include reducing single-use packaging and supporting circular economy practices, both of which overlap with eco-packaging and un-packaging concepts.

CAP's eco-schemes incentivize sustainable practices in farming and product processing, which can cover the use of sustainable packaging. Additionally, CAP encourages partnerships along the supply chain to minimize waste, which includes exploring un-packaging practices for certain products.

By fostering sustainable practices in agriculture and food production, CAP serves as a catalyst for adopting eco-packaging and un-packaging practices across Europe. This aligns with the EU's overall goals for waste reduction, circular economy, and environmental protection.

One of the key actions highlighted in the CAP reform is the enhancement of partnerships. The CAP 2023-27 aims to strengthen the position of farmers in the supply chain and boost the competitiveness of the agri-food sector by improving bargaining power. New rules reinforce producer cooperation, encouraging farmers to work together and enabling them to create countervailing power in the market.<sup>16</sup>

The food industry is increasingly aware of the importance of environmental sustainability. In this context, recycling and reuse of materials play a very important role in reducing the environmental impact of the entire production chain, from the factory to the consumer and the final company.

In this scenario, it is crucial to adopt practices that reduce environmental impact and promote sustainability.

## **2.4 Greenwashing and the implications for packaging companies**

The European Commission, on March 22<sup>nd</sup>, 2024, recognised the seriousness of the greenwashing problem and proposed new rules to combat it. The rules aim to provide consumers with clearer and more reliable information on the sustainability of products to protect them and at the same time companies that operate in a truly sustainable manner.

The European Commission's new proposals on stricter rules for green claims impact a wide range of companies, particularly those in industries like retail, consumer goods, fashion, food and beverages, and electronics, where environmental claims are frequently made to attract eco-conscious consumers. Under these proposals, companies must substantiate their environmental claims with solid scientific evidence, covering the entire product life cycle - from production to disposal - to ensure accuracy and prevent "greenwashing."

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<sup>16</sup> European Commission (n.d.). The common agricultural policy: 2023-27. Available at: [https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27\\_en](https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en). Accessed 13 October 2024

The new proposals of the EC include:

- **Stricter rules for 'green claims':** companies will have to provide solid scientific evidence to support any environmental claims, avoiding vague or exaggerated terms. They will also have to assess the entire product life cycle, from production to disposal, to ensure that claims are complete and accurate.
- **Mandatory independent verification:** all environmental claims will have to be verified by independent and accredited third parties before being communicated to consumers. This will ensure the reliability of information and reduce the risk of greenwashing.
- **Regulating environmental labels:** the proliferation of different and often unclear environmental labels has created confusion among consumers. The new rules aim to limit this proliferation, allowing only new labelling schemes developed at European level and based on strict and transparent criteria.

The global focus on environmental sustainability has led to a significant increase in demand for 'green' products and services. In the packaging sector, this trend is reflected in an increasing focus on recycled, biodegradable, and compostable materials as well as production processes with a low environmental impact.

The new European standards represent a significant challenge for packaging companies but also offer important opportunities.

#### Challenges:

- **Increased transparency and accountability:** companies will need to be more transparent in communicating the environmental credentials of their products and take responsibility for ensuring the accuracy of the information provided.
- **Investment in independent verification:** companies will need to invest in independent verification processes to ensure compliance with the new standards.
- **Risk of penalties:** companies that do not comply with the new standards will risk fines and reputational damage.

#### Opportunities:

- **Competitive advantage:** companies that invest in sustainable practices and transparently communicate their environmental credentials will be able to differentiate themselves from competitors and gain consumer trust.

- **Increased sales:** consumers are increasingly willing to pay a higher price for sustainable products, and the new standards will facilitate their choice.
- **Improved corporate image:** a concrete commitment to sustainability can improve a company's image and attract new customers and investors.

Therefore, all enterprises should make sure that to guarantee that the packaging they choose is truly sustainable and complies with the new European regulations, it is important to consider the following aspects when choosing suppliers:

- **Transparency and traceability:** favour suppliers who offer clear and detailed information on the environmental impact of their products and processes, at all stages of the life cycle. Ask for documentation showing the origin of materials, the production processes used and how they are disposed of.
- **Sustainable innovation:** opt for suppliers who invest in research and development to create innovative and environmentally friendly packaging solutions. Verify the use of recycled, biodegradable or compostable materials and the adoption of energy-efficient production processes.
- **Transparent communication:** beware of vague or general statements on sustainability. Give preference to suppliers who provide concrete and verifiable data, supported by recognised environmental certifications.
- **Expertise and advice:** choose suppliers who demonstrate sound sustainability expertise and are able to offer personalised advice on which packaging solutions are best suited to your company's specific needs.
- **Independent verification:** ensure that suppliers' environmental declarations have been verified by independent, accredited certification bodies. This will ensure the reliability of the information and compliance with new European regulations.

### 3. Eco-packaging and Unpackaging

Eco-packaging and unpackaging are both strategies which aim at reducing the negative impact on the environment regarding the life cycle of a product, specifically within the agri-food industry. Here is a summary of what each concept means and how it could be beneficial for social economy entities: Social economy entities (SEEs), which are organizations focused on social, environmental, and economic value rather than profit maximization, can play a crucial role in the promotion of eco-packaging and un-packaging. These entities include cooperatives, non-profit organizations, social

enterprises, and fair-trade organizations. Here's how SEEs connect to eco-packaging and un-packaging practices:

### 3.1 Eco-packaging

This concept of packaging involves the creation of packages that will have the least environmental impact. This entails the use of materials that are<sup>17</sup>:

- Biodegradable: Materials that can decompose naturally into harmless elements such as compostable films or natural fibers.
- Recyclable: Packaging that has the potential to be processed into other new packaging materials to save on resources.
- Reusable: Packaging specifically made for repeat usages such as glass jars or sturdy containers that can be brought back by consumers for refilling or reusing them at home.
- Minimal: There is no more packaging than necessary, or designs which do not have excessive fillers, wrappers or labels.

#### Benefits for social economy entities:

The use of eco-packaging makes great strides in sustaining and enhancing the green movement, facilitating conscious purchasing among consumers, and even offering opportunities for waste management savings. For social economy entities, it is a way of demonstrating concern for both the environment and social values, particularly where such entities can obtain eco-friendly materials locally contributing towards the economy of that community.

### 3.2 Unpackaging

The unpackaging concept aims to reduce packaging by devising ways to sell items in bulk and/or designing refillable systems around the products. It is common in zero waste shops but, in the case of agri-food, it is starting to appear as well since consumers are encouraged to come with their containers for example.

Illustrations of unpackaging in agri-food:

- Bulk sales: A farmers' market or a co-op outlet selling grains, spices, or oils in bulk can allow customers to come with their containers and purchase only what they require.
- Refill stations: Various other businesses have also been identified as having refill stations for oils, honey or dairy where customers refill the used bottles, jars and other containers.

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<sup>17</sup> FoodNavigator: Insights into biodegradable packaging solutions and the circular bioeconomy.

<https://www.foodnavigator.com/Article/2021/Food-packaging-Organic-recycling-hailed-the-most-sustainable-solution>

- **Edible or minimal packaging:** Use of rice paper as an edible wrapper for some food products or use of nearly-naked wraps only when required.

#### **Benefits for social economy entities:**

Unpacking can reduce scouting costs in terms of packaging and foster closer ties with the customers and minimize wastage. Unpacking for the social economy entities is a way to spearhead the movement towards a circular economy as it helps to position the brand as a sustainable brand appealing to like-minded consumers. For a good number of social economy entities, the eco-packaging and unpackaging strategies, aligned with core values of sustainability and social responsibility, allow them to offer services to a wider clientele both on-site and through delivery. This combination not only aids to reduce cost and waste but also assists to form consumer bases, helping to encourage the community to be more sustainable over time.

### **3.3 Eco- packaging and social economy entities in the agri-food sector**

Eco-packaging can bring high-returning dividends to social economics units within the agri-food system in both economic and social terms. Here are some of the ways it helps:

- **Decrease environmental impact:** The use of eco-friendly materials allows social economy entities to reduce their negative environmental impact, which complements their often-social impact driven initiatives. This approach aids in fostering sustainable practices in their respective communities, thus showing possibilities of ecological responsibility.
- **Environmental sustainability as a cross-cutting theme:** Eco-packaging may also improve the overall appeal of a brand since its target market can be customers who are willing to purchase from companies that care about the environment. This can help social economy entities in building their market reputation and in customer retention<sup>18</sup>
- **Reduced cost in the long run:** Eco-packaging may be expensive for the initial stages but it has the tendency to save cost in the long run because it reduces disposal size and if materials are reusable or biodegradable it would save cost as well.
- **Support local economy:** There are many types of eco-packaging available to local jurisdictions so eco-packaging would help grow the local ecosystem. There will also be local employment opportunities as social economy entities will target local eco-packaging suppliers, stimulating job creation.
- **Educational awareness:** Emancipating people is among the primary concerns of many social economy entities, and there is no doubt that eco-packaging is a useful tool for fostering such thought. Through packaging and marketing their eco-friendly products, they would help in

<sup>18</sup> Sustainable Product Packaging: Algramo employs smart dispensing systems to reduce single-use plastics, encouraging sustainable consumption.:

<https://blog.movingworlds.org/social-enterprises-tackling-plastic-pollution/>

educating the general public on the need to use such eco-friendly products, which will in turn elicit interest in the larger community.

- **The relevance of the policy and availability of the funds:** Eco-packaging is directly in line with EU and global policy goals that are geared toward the advancement of the circular economy. Organizations that adopt eco-packaging products may have better chances of accessing funds, grants or even partnerships aimed at advancing sustainability in the agri-food industry.
- **Improving the social objective:** Since eco-packaging typically practices ethical sourcing and produces by default, it fits well the social objectives of many organizations that operate in social economy sectors. It advances one more dimension of sustainability, namely social value, in addition to environmental protection.

It is therefore promptly appropriate to conclude that by using eco-packaging tools and approaches, the social economy, entities from the agri-food sector are able to strengthen their social missions, cut their costs and enhance their competitiveness while contributing to a green economy.

Social economy entities often prioritise environmental sustainability, and eco-packaging aligns well with these goals. Some of the key connections are:

- **Sustainable product packaging:** Many social enterprises focus on offering products that are sustainably packaged, using recyclable, biodegradable, or compostable materials. For example, food cooperatives or social enterprises in the retail sector may adopt eco-packaging to align with their environmental values, benefiting both the planet and the local communities they serve.
- **Upcycled and Recycled Materials:** Social economy organizations often promote circular economy practices. This includes using recycled materials in their packaging and encouraging consumers to recycle. For example, a social enterprise might source packaging made from post-consumer recycled materials, which helps reduce waste while supporting the local economy.
- **Local sourcing and reduced environmental impact:** SEEs may prioritise local sourcing and low-carbon packaging alternatives, reducing the environmental footprint of transporting goods and packaging materials. They often focus on minimising waste throughout the product life cycle, which also includes choosing eco-friendly packaging.
- **Inclusive employment:** Many social economy organisations use packaging as an opportunity to create jobs for marginalized groups, such as people with disabilities or long-term unemployed individuals. These organizations can incorporate eco-packaging practices while offering valuable employment opportunities.

### 3.4 Un-packaging and social economy entities in the agri-food sector

The concept of un-packaging—reducing or eliminating packaging entirely—is also tied to the ethos of social economy entities, especially in terms of waste reduction and resource efficiency.

- **Bulk sales and refill stations:** Social economy entities often promote bulk-buying or refill stations, where customers bring their own containers to purchase products without packaging. For example, many zero-waste stores and food cooperatives are run by social enterprises, which embrace un-packaging practices to reduce waste and support sustainability.
- **Encouraging reuse and repair:** Social enterprises may also focus on repairing or reusing products, thus reducing the need for packaging altogether. For example, an organization that collects and repairs electronics could reduce the need for new packaging, contributing to the reuse economy. Similarly, businesses involved in second-hand goods can minimize packaging or use sustainable alternatives.
- **Community-led initiatives:** Social economy entities often run community-based initiatives that encourage local residents to reduce their consumption of single-use packaging. For instance, cooperative-run farmers' markets or bulk food stores may encourage consumers to bring reusable bags, containers, or bottles to avoid packaging waste.
- **Education and awareness raising:** Social economy entities can play a crucial role in educating consumers about the environmental impacts of packaging and encouraging them to adopt un-packaging practices. They may provide training, campaigns, or workshops on how to reduce packaging waste at the consumer level, further promoting sustainable behaviour in communities.

## 4. Best practices on food waste and circular economy

Social economy entities and eco-packaging/un-packaging are deeply interconnected, with SEEs often at the forefront of promoting sustainable packaging solutions and reducing packaging waste. Through their focus on environmental and social responsibility, these entities not only contribute to reducing waste and carbon footprints but also create positive social outcomes by fostering local economies, promoting fair trade, and encouraging community-wide participation in sustainability efforts. Their role in eco-packaging and un-packaging can lead to both environmental and social benefits, helping create a more circular and equitable economy.

### Box 2. The Bella Dentro (Italy)<sup>19</sup>

Food waste is not just about food. To get food to our tables, numerous natural resources are invested, with a major environmental impact. With wasted food, resources such as water, fertilizer, soil, fossil fuels and energy resources of all kinds are also wasted.

Since 1974, food waste has increased by 50 percent, with billions of tons of food ending up in the dustbin. An analysis conducted by the FAO, shows that food waste in the world amounts to more than 1.3 billion tons per year - out of 3.9 billion tons of food produced, 1.3 end up in the trash.<sup>20</sup>

Food waste has three critical points:

1. Food losses: covers losses upstream in the food supply chain;
2. Food waste: the waste that occurs during industrial distribution;
3. Household waste: purchased foods that are not consumed.

Food waste in Italy is of great concern. One year of food waste in Italy would feed forty-four and a half million people. According to scientific research from the University of Naples<sup>21</sup> in 2012, food waste in Italy touched 1,226 million cubic meters of water used to produce the food that was then thrown away without being consumed. An incredible waste of water when one considers that the same amount of water could have met the annual water needs of 19 million Italians.

On the emissions front, 24.5 million tons of CO<sub>2</sub> are unnecessarily released into the atmosphere to produce food goods destined for the dustbin. The figures just reported are frightening, which is why solutions need to be found to reduce food waste and thus environmental impact and social inequality.

<sup>19</sup> For more details, please visit Inside, B. (2022, May 17). Waste in the fruit and vegetable supply chain. Bella In. <https://www.belladentro.org/lo-spreco/> Accessed: 13 October 2024

<sup>20</sup> <https://www.fao.org/newsroom/detail/FAO-UNEP-agriculture-environment-food-loss-waste-day-2022/en>  
<https://onfoods.it/magazine/food-waste-rise-italian-households-findings-2024-report-waste-watcher-observatory>

The **Bella Dentro** project was born in 2018 from an idea of Luca and Camilla, two twenty-eight-year-olds, who managed to create a logistical network in the territory, buying ugly products at a fair price, directly from producers, and then reselling them directly to consumers, at a lower price than in supermarkets. The goal is to create a true alternative waste-free supply chain that starts from the field and reaches the table, where every step is guaranteed, transparent and respectful of the “inner beauty” of the products.

For a year and a half, Luca and Camilla drove all over Milan in their bee car to sell fruits and vegetables. The feedback was immediately positive, people were intrigued and came by to taste their products, later becoming customers. So, they decided to open a physical store in **Milan**, so they could save more and more fruits and vegetables. In 2020, they succeeded in creating the first line of processed products, so they can store fruits and vegetables longer and thus avoid generating waste in turn. Anything that remains unsold is donated to neighbourhood charities. The workshop in which the products are processed is also not left to chance. The products are processed by the Social Cooperative, which trains and employs children and adults with autism or severe cognitive retardation.

### Box 3. Solinatra (United Kingdom)<sup>22</sup>

*Solinatra* is a company that aims to facilitate the transition to a circular and sustainable economy for those companies seeking alternative materials to disposable plastic. In fact, Solinatra's various patented biomaterials are suitable for containing food and organic materials without compromising their qualities and lend themselves to the injection moulding process. This makes them perfect for those businesses that have already invested in machinery and technology for the large-scale production of disposable utensils in the food sector (such as espresso pods, coffee lids, disposable cutlery, etc.), but wish to transform themselves into more sustainable and less polluting companies without having to reinvent the entire production chain.

Bio-based materials or biomaterials are derived partially or entirely from biomass and do not consist of components of fossil origin. Bio-based materials derive partially or entirely from bioproducts. These elements, being made of renewable materials, can help reduce CO<sub>2</sub> and offer other advantages such as low toxicity and biodegradability.

At the European level, the bio-based products sector is considered a priority as it represents an opportunity for the economy to be more sustainable and reduce its dependence on fossil fuels. According to European Commission estimates, bio-based products and biofuels generate annual revenues of approximately EUR 57 billion and employ 300,000 workers.

The production costs of these bioplastics are still high, but companies like Solinatra are heading in the direction of a future of non-polluting disposable products.

<sup>22</sup> For more details, please visit <https://www.solinatra.com/> Accessed : 13 October 2024

#### Box 4. Sufresca (Israel)<sup>23</sup>

*Sufresca* is an innovative company specialising in the production of natural, edible food coatings with the aim of offering a sustainable alternative to single-use plastic. Its mission is to address the problem of food waste and the environmental impact of plastic packaging in the food industry. Its main focus is on replacing plastic packaging used in the food industry, as around 70% of the plastic used in this sector ends up in the seas and oceans. Its biodegradable liners are made exclusively from natural ingredients and are water-soluble, offering a convenient alternative for packaging foodstuffs such as fresh fruit and vegetables. Due to their biodegradability, the liners can be disposed of with organic waste instead of traditional plastic.

In addition, *Sufresca* has developed a patented method to make its liners water-resistant, allowing them to be used to contain liquids and semi-liquids. The seaweed used to produce the liners is cultivated in an ecologically and socially sustainable manner, ensuring fair compensation for the farmers and contributing to the improvement of their living conditions. *Sufresca* is committed to several key objectives, including increasing the income of raw material farmers, preserving and expanding clean coastal areas, and reducing plastic waste and CO<sup>2</sup> emissions produced in Indonesia. Its work has been recognised with several awards, including the Social Venture Challenge Asia and the Circular Design Challenge, highlighting its commitment to innovation and sustainability.

#### Box 5. Imperfect Foods (United States)

*Imperfect foods* is an innovative company that has quickly established itself in the food waste sector. To date, the company has saved more than 79,000 tonnes of imperfect food and has 400,000 consumers.

The company's main goal is to reduce food waste. To do this, the company connects agricultural producers directly with consumers. It offers consumers food that is aesthetically imperfect but edible.

*Imperfect Foods* implements a business model based on subscriptions, which can be customised according to one's needs and food preferences. Customers can choose from numerous types of fruit, vegetables, meat, dairy products and more each week.

Another focus of this company is definitely on environmental sustainability. They work hard to reduce the environmental impact in their production and distribution processes, minimising the use of plastic and collaborating with local charities to which they donate excess food.

This company is committed to educating the public about the big problem that is food waste and tries to promote more conscious and sustainable consumption.

<sup>23</sup> For more details, please visit: <https://sufresca.com/>. Accessed 13 October 2024



# Greening Agrifood in Social Economy

Capacity building on Greening Agrifood in Social Economy

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**Taste the waste - how does food waste occur; how  
can we prevent it and what is its ecological footprint?**

## TRAINING MATERIAL

Date of the training: 29 January 2025

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## 1. Introduction

Food waste is one of the central problems of our time. In a world where around 828 million people suffer from hunger (FAO, 2022), around 59 million tonnes of food are wasted every year in the EU (Eurostat, 2022). This waste not only puts a strain on the social and economic fabric, but also has significant environmental consequences, including the unnecessary consumption of resources such as water and soil and the emission of greenhouse gases. Against this backdrop, it is crucial to comprehensively analyse the issue of food waste and food loss and identify measures that can help prevent such waste.

This paper summarises facts about food waste in the EU and the associated ecological footprint. It shows where the waste occurs, what are the causes and what measures have already been taken to eliminate them. It also takes stock of what efforts to prevent food waste have achieved. The focus is on the following questions:

- What are the facts and figures about food waste in the EU?
- What are the main causes of food waste in the EU?
- What is the ecological footprint of food and what is the ecological footprint of food waste?
- What measures have already been taken in the EU to effectively reduce food waste?
- What is the contribution of the social economy to preventing food waste?
- What are best practice examples for preventing food waste?

## 2. Definitions, basics and facts

### 2.1 Food waste versus food loss: definition

Food waste refers to edible food that is disposed of along the entire value chain - from cultivation to the end consumer. In contrast, the term food loss primarily refers to losses that occur before processing or marketing, for example due to harvest losses or improper storage (FAO, 2019).

### 2.2 Causes of food waste in the EU

The causes of food waste in the EU are complex and multi-layered. At the agricultural level, overproduction, strict trade standards and harvest losses lead to considerable losses. In the retail and catering sectors, unrealistic best-before dates, miscalculations and oversupply contribute to the problem. On the consumer side, a lack of planning, incorrect storage and a low appreciation of food play a major role (Caldeira et al., 2019).

## 2.3 The ecological footprint of food: Definition

The ecological footprint describes the number of resources required for the production, processing, storage and disposal of food. Factors such as land use, water consumption and energy consumption as well as the resulting greenhouse gas emissions are considered.

## 2.4 Current facts and figures

The EU is one of the largest food producers in the world and also produces considerable amounts of food waste. According to current estimates, around 88 million tonnes of food waste are generated in the EU every year, which corresponds to 20% of total food production (FAO, 2020). A study by the European Commission (2020) shows that around 53% of food waste is generated at household level, while agriculture, processing, catering and retail account for the remaining 47%. As losses generally occur at every link in the value chain, it is a logical consequence that waste tends to increase with the length of the value chain. In other words, the more stages a product passes through from production to the end consumer, the greater the risk of losses and waste.

- **Agriculture:** The main losses are caused by unutilised harvests and quality standards.
- **Processing:** Losses often occur due to inefficient processes and production surpluses.
- **Trade:** Oversupply and strict cosmetic requirements contribute to waste.
- **Consumption:** Lack of planning and throwing away edible food are key causes.

# 3. Ecological footprint of food waste

## 3.1 Water consumption due to wasted food

Food waste has a significant impact on the use of water. Every year, around 250 billion cubic metres of water are used in the EU alone to produce food that is not consumed (FAO, 2020).

## 3.2 Greenhouse gas emissions from wasted food

Food waste is a significant contributor to greenhouse gas emissions in the EU. According to an estimate by Eurostat (2022), wasted food in the EU causes around 186 million tonnes of CO<sub>2</sub> equivalents annually, which accounts for 3-4% of the total CO<sub>2</sub> equivalents emitted in the EU. Methane emissions caused by the decomposition of organic waste in landfills are particularly problematic. In a global context, food waste, if it were a country, would rank third behind China and the USA in terms of CO<sub>2</sub> emissions (FAO, 2020). It makes a considerable difference which food is wasted: While, for example, a kilo of tomatoes produced regionally and seasonally only generates around 0.2 kilograms of CO<sub>2</sub> equivalents (Federal Environment Agency, 2020), wasting 1 kg of beef generates around 27 kilograms of CO<sub>2</sub> equivalents. This illustrates that the ecological footprint of

food varies greatly and that avoiding the waste of particularly resource-intensive products has a greater impact on climate protection.

### 3.3 Land consumption of food waste

A significant proportion of global agricultural land is used to produce food that is never consumed. In the EU, it is estimated that around 30 million hectares of land - an area larger than Italy - is used for wasted food.

### 3.4 Comparison: EU in a global context

In a global comparison, the EU is in the upper range when it comes to food waste. While losses in developing countries mainly occur in the early stages of the value chain, in industrialised countries such as the EU, the largest quantities occur at retail and consumption level. The amount of food loss correlates strongly with a country's prosperity. Food waste is therefore a problem of prosperity and thus also a problem of social justice. According to an estimate by UNEP (2021), the 828 million starving people worldwide could be fed if the globally wasted food were distributed fairly. World hunger is therefore not a problem of a lack of food, but a problem of unfair and senseless distribution.

## 4. Sources of Food Waste

Food wastage follows inefficiency and systemic problems at the food supply level. For the understanding of the sources, following is the analysis along with relevant studies and insights: (cf., Food Waste in School Catering: An Italian Case Study, 2021)

### 4.1 Agriculture

Agricultural food waste could be due to various reasons that can be economic, environmental, and logistic.

Market price fluctuations: FAO studies show that as much as 14% of food produced globally is lost between harvest and retail, much of it left in the fields due to low market prices or high transportation costs (cf. FAO, 2019).

Quality and aesthetic standards: The appearance expectations of retail and consumers result in the rejection of fruits and vegetables, adding up to immense wastage. For example, the FUSIONS project by the European Commission estimates that cosmetic filtering accounts for 20-40% of produce losses (cf. European Commission, 2016).

Surpluses due to overproduction: In order to protect themselves against low yields, farmers might plant more than what is actually needed. This results in excess harvests that might not find a market.

Poor harvest methods: many of the losses in the field, particularly for grains and root vegetables, are linked to inefficiencies in the technological machinery utilized for harvest.

## 4.2. Processing and Manufacturing

During processing, food losses occur because of industrial inefficiencies and standard operations:

**Trimnings and by-products:** One example could be the millions of tonnes of fish heads, bones, and general waste produced as a result of seafood; this can, in turn, potentially be transformed into something usable, like fertilizers or animal feeds.

**Operational errors:** Wraps reported 2021 that recipe formulation and packaging or labelling mistakes could generate about 1.5 million tonnes of wastes within UK food manufacturing annually.

**Energy costs:** Businesses could be discouraged due to high energy costs needed for the preservation or processing of surplus food.

**Batch overproduction:** Most large-scale productions result in goods that exceed demand.

## 4.3. Distribution and Retail

Food waste at retail and distribution is because of inefficiencies and consumer-driven causes:

**Cold chain breakdowns:** Poor refrigeration during transportation is a big contributor to spoilage. According to studies conducted by the Food Loss Index of UNEP, perishable items such as meat, dairy, and seafood are more prone to getting spoiled (cf. FAO, 2019). This is particularly unfortunate because, as we saw in the chapter on the ecological footprint of food, these products have a larger footprint than most others.

**Overstocking:** Overstocking by retailers to ensure full shelves results in unsold items reaching their expiration date (cf. FAO 2019).

**Promotions and discounts:** Bulk sales and promotions encourage over-purchasing, leading to waste when products are not consumed in time (cf. FAO 2019).

## 4.4. Households

The households continue to top the list as among the most key contributors of food waste; all this has been mainly brought about by lack of awareness and social norms:

**Food waste statistics:** Households generate an estimated 570 million tons of food waste annually, accounting for over 60% of global food waste, according to a report by the UN Environment Programme (2022).

**Storage practices:** Not knowing the right conditions in which fruits, vegetables, and dairy products should be stored causes them to go bad. Potatoes and onions, for example, accelerate the process of decaying when kept together.

**Confusion over date labels:** The UK's Food Standards Agency estimates that 20% of all household food waste is confused by "use by" and "best before" dates (cf. FAO, 2019).

**Poor portion sizes and leftovers:** Lousy meal planning and large portions also mean that often, too much food is prepared, which does not get eaten (cf. FAO, 2019).

## 4.5. Institutional Settings - Schools, Hospitals, Restaurants

Operational inefficiency and inflexibility in food preparation result in generation of waste from institutions:

Large-scale preparation: Food preparation in bulk results in overproduction in school canteens. The Rockefeller Foundation has estimated that up to \$1.2 billion worth of food is wasted every year in the United States because of this very fact.

Lack of choice: Standardized meal portions do not align with the preference or appetite of the individuals, which may lead to waste by not being consumed.

Lack of redistribution mechanisms: Most institutions lack the systematic way of redistributing surplus food for charity purposes or composting.

Cultural issues: In some areas, food waste is further perpetuated by cultural practices that make people not reuse leftovers.

## 5. Measures against food waste

### 5.1 Measures at European level

The EU has taken a variety of measures to reduce food waste at different levels of the value chain, focusing on technical, legislative, and collaborative approaches. Together, these measures reflect a comprehensive approach to tackling food waste, addressing the issue from multiple angles to achieve significant reductions.

**Technical measures:** The EU has promoted the adoption of smart packaging technologies through the Circular Economy Action Plan and initiatives like the EU Packaging Directive. These aim to improve product traceability and reduce waste by providing consumers with real-time information on freshness. These technologies help minimise waste during processing and retail by extending shelf life and preventing spoilage.

**Legislative measures:** Legal frameworks play a significant role in addressing food waste. The EU has worked on the harmonisation of best-before dates to avoid unnecessary disposal of still-edible food. Tax incentives have been introduced to encourage food donations and channel surpluses more efficiently to those in need. The "Farm-to-Fork Strategy" is central to achieving the EU's ambitious goal of halving food waste by 2030. Legislative adjustments also target the simplification of donation processes to ensure surplus food reaches vulnerable populations.

**Collaborative initiatives:** The "EU Platform on Food Losses and Food Waste" (UN 2025) brings together stakeholders from different sectors to share best practices and develop innovative solutions. Programmes like Horizon Europe fund research and innovation projects aimed at creating advanced technologies and methodologies to tackle food waste. By fostering cooperation across the value chain, these initiatives strengthen the collective effort to reduce waste.

The European Food Banks Federation (FEBA) plays a central role in promoting food donation. In 2020, 335 food banks in Europe collected and distributed 860,000 tonnes of food to 12.8 million people in need, supported by over 37,000 volunteers (Gorgan et al. 2022). The Food Loss and Waste Platform, launched by the European Commission (United Nations 2025), is a collaborative effort involving various stakeholders, with the goal of achieving the United Nations Sustainable Development Goal 12.3 by 2030. This ambitious objective aims to halve food waste and facilitates the exchange of best practices. See also the best practice examples on 5.3.

## 5.2 Measures at national level

In addition, various EU countries are focusing on national initiatives. Germany is focusing on educational programmes and tax incentives for food donations, food banks have developed into a widespread system that is now represented in even the smallest municipalities (cf. Zhu et al., 2023, Fesenfeld et al., 2022). Italy is pursuing a legal basis to facilitate food donations with the Gadda law. The Portuguese retail chain Sonae is in the process of developing a digital platform called LIFEFood Cycle, with the aim of optimising the management of surplus food and facilitating its donation to charitable organisations or sale to business partners at reduced prices (Eurocommerce, 2025). In Estonia, an agreement was signed between the Ministry of Social Affairs and the Estonian Food Bank to support people in financial difficulty and optimise the use of food (cf. Dongo et al. 2024). In Slovenia, an agreement was signed by eight interest groups with the aim of achieving the goals of the national strategy to reduce food losses and waste (cf. *ibid.*). In Denmark, the 'Stop Wasting Food Denmark' movement has been working with the REMA 1000 retail chain since 2008 to achieve 'zero food waste' by 2030 (*ibid.*). In France, retailers are obliged to donate food. In Ukraine, the main focus is on improving logistics and establishing a donation culture, while Romania is focussing on projects that reduce losses in agriculture.

These examples show that social economy enterprises in Europe are actively contributing to the reduction of food waste through innovative solutions, collaborations and research projects. Collaboration between different stakeholders and the creation of a favourable framework for innovation appear to be key factors for success (Zhu et al. 2023; Fesenfeld et al. 2022). But even all these measures will not be enough to achieve the goal of halving food waste by 2030.

After all short food supply chains play a crucial role in reducing food waste by promoting efficient and sustainable food systems. Since waste occurs at every stage of the food supply chain, it stands to reason that shortening the chain can prevent waste. By minimising the distance between producers and consumers, these systems significantly reduce the time food spends in transit and in storage, helping to maintain its freshness and prevent spoilage. This benefit is especially important for perishable goods, as faster distribution reduces the likelihood that food will be thrown away due to overripening or damage.

Furthermore, short food supply chains enable producers to better match supply with actual demand. By selling directly to consumers or local markets, producers can more accurately anticipate consumption patterns and avoid overproduction. By contrast, longer supply chains often suffer from unpredictable demand, leading to higher levels of overproduction and waste.

Promoting seasonally and locally produced food also helps to prevent waste. Seasonal products require less storage and transport, which reduces the risk of spoilage. In addition, local sales encourage the acceptance of 'ugly' or imperfect products – products that are often discarded in larger supply chains due to cosmetic defects. These products are perfectly edible despite their appearance and can help to avoid unnecessary waste.

However, achieving short food supply chains requires major changes across the entire food sector, which are not so easy to achieve.

### 5.3 Individual initiatives - best practice

There are numerous successful approaches and initiatives around the world that show how food waste can be effectively reduced. These best practice examples serve as inspiration for countries, companies and individuals and illustrate that creative solutions, technological innovations and a strong community can help to significantly reduce food waste.

**Too Good To Go:** The app from Denmark connects restaurants, bakeries and supermarkets with consumers to offer surplus food at a reduced price. This model has already spread across Europe and is helping to reduce food waste in the catering and retail sectors. For more information check here: <https://www.toogoodtogo.com/de>.

**Community food sharing:** Initiatives such as "Foodsharing" in Germany enable volunteers to collect surplus food from households, shops and restaurants and distribute it free of charge. This movement has not only led to a reduction in waste, but has also raised awareness of the value of food. For more information check here: <https://foodsharing.de/>.

**Unpackaged shops:** These shops promote the purchase of food in the exact quantity required, thus reducing packaging and food waste. In particular, products such as rice, pasta or nuts, which often spoil when packaged in large quantities, can be purchased here. For more information check here: <https://www.unverpackt-verband.de/>.

**Consumer awareness campaigns:** Countries such as France and Italy have used legislation and awareness campaigns to encourage consumers to use food more efficiently and use leftovers creatively. For more information check here: <https://www.sprecozero.it/>.

**Food banks:** Organisations such as the "Tafel" in Germany collect surplus food that is still edible and distribute it to those in need. This practice has both social and environmental benefits and shows how surplus food can be put to good use. For more information check here: <https://www.eurofoodbank.org/>.

**Community Supported Agriculture (CSA):** A remarkable example of best practice is the concept of Community Supported Agriculture (CSA). Consumers and farmers join together to form a direct partnership. Consumers pay a membership fee that secures them regular deliveries of fresh, seasonal food, while farmers receive a stable source of income. This model not only reduces food waste by avoiding overproduction, but also raises awareness of the origin and value of food. For more information check here: <https://urgenci.net/>.

**EuroCoop:** Another best practice is the EuroCoop initiative, an association of consumer cooperatives in Europe. EuroCoop focuses on educational programmes that promote the responsible use of food and supports members in adopting sustainable practices. One successful example is the co-operation with food banks, through which surplus but edible food is distributed to those in need. These measures not only help to reduce waste, but also promote social responsibility. For more information check here: <https://www.eurocoop.coop/>.

**School Canteens:** Schools in Italy or Portugal that have successfully reduced waste by introducing flexible portion sizes and "share tables" for uneaten but untouched food. Implementing strategies like flexible portion sizes and "share tables" in school canteens has proven effective in reducing food waste. Flexible portion sizes allow students to choose quantities that match their appetites, minimizing leftovers. "Share tables" provide a designated area where students can place unopened

or untouched food items they don't wish to consume, making them available for others. (Food Waste Perception of Workplace Canteen Users—A Case Study, 2019)

**“Brutti ma buoni”:** The "Brutti ma Buoni" project (translated as "ugly but good or in Germany for example called ugly food") is an initiative focused on reducing food waste by using imperfect or surplus produced products that would otherwise be discarded. The project promotes the idea that food doesn't need to be perfect in appearance to be delicious and nutritious. It involves creating products, often in the form of snacks or packaged goods, made from fruits and vegetables that are misshapen, overripe, or slightly damaged but still perfectly good to consume. The project aims to raise awareness about food waste and sustainability while offering consumers an eco-friendly alternative to conventional food products. By utilizing "ugly" produce, the project helps minimize waste at the farm level, supporting local farmers and reducing the environmental impact of food production. The goal is also to shift consumer perceptions about the value of food based on its appearance rather than its nutritional quality. "Brutti ma Buoni" often includes partnerships with local businesses, farmers, and community initiatives, and it may involve a variety of products such as jams, juices, crisps, and dried snacks, all made from produce that would otherwise go to waste (Brutti ma buoni, 2017).

## 6. Food sharing as a model of cooperative economics

### 6.1. The concept

Food-sharing initiatives collect surplus and surplus food that would otherwise be wasted and redistribute it to people who consume it. This is done by collecting the food either directly from private households and businesses or through online platforms and communities. In some cases, cooperation with shops and supermarkets is also sought. The food sharing platform currently has over 100,000 users in Germany, Austria and Switzerland. Registration on the platform is free.

In Germany alone, more than 30,000 volunteers are involved (NAHhaft e.V. 2025). They create spaces for people to meet and exchange ideas, and promote solidarity and mutual support.

### 6.2. Food sharing: an example of social economy for food rescue and cooperative economies

Food sharing initiatives can be characterised as social economy projects for various reasons. One of the main characteristics is their focus on the common good, with profit maximisation taking a back seat. Food-sharing initiatives primarily pursue social and ecological goals and are not geared towards maximising profits. Instead, they are committed to reducing food waste and using resources more sustainably (foodsharing e.V. 2023). Food-sharing is an alternative economic model that differs from conventional businesses in some ways: The initiative works without money and food is rescued and redistributed for free (ibid.). In contrast to commercial food rescue apps, there is no monetisation of activities. The work is based almost entirely on volunteer efforts (Food sharing Cafe Network 2023). An important aspect is the promotion of community and participation. Food

sharing creates new forms of collaboration and social exchange. The initiatives connect people from different backgrounds and foster community building. Decisions are often made democratically, e.g. through community votes, and everyone has the opportunity to get involved and actively shape the initiative.

Creative concepts are developed in food sharing to combat food waste, e.g. digital technologies such as online platforms for networking, 'Fair-Partner' as public redistribution points for rescued food (Wickert & Günther 2023), as well as educational and awareness-raising work to sensitise the public.

Food sharing favours cooperation over competition. The initiative works with companies, social organisations and other initiatives, and complements existing services such as food banks.

These characteristics clearly distinguish food sharing initiatives from for-profit companies and embody central principles of the social economy such as solidarity, sustainability and social participation.

## 7. Take stock

Food waste is a problem of prosperity and represents a huge challenge in the EU, with social, economic and environmental impacts. Millions of tons of edible food are thrown away every year, resulting in significant resource consumption and greenhouse gas emissions. At the same time, people are starving worldwide for whom there would actually be enough food if it were distributed fairly.

The EU has already taken important steps with strategies such as the "Farm-to-Fork Strategy", the promotion of food donations and the platform for the exchange of best practices. Nevertheless, there is still a long way to go to achieve a sustainable reduction in food waste. National initiatives and innovative approaches, such as community-supported agriculture (CSA), apps like Too Good To Go and collaborations with food banks, show that effective solutions exist. However, these need to be scaled up and implemented more widely across the EU.

Achieving the goal of halving food waste by 2030 will require a combination of technological innovations, legal adjustments and a broad sensitization of the population. Collaboration between all stakeholders along the value chain - from agriculture to retail to consumers - will be crucial in order to bring about sustainable change. Every step in this direction not only contributes to environmental protection, but also to greater social justice.

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# Greening Agrifood in Social Economy

Capacity building on Greening Agrifood in Social Economy

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## Hands-On Biodiversity

### TRAINING MATERIAL

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## 1. Introduction

### What is biodiversity?

Biodiversity, or biological diversity, describes the variety of life on Earth. It includes the genetic diversity within species, the diversity of species themselves, and the diversity of the ecosystems in which they exist. This diversity is the basis for functioning ecosystems that sustain life on our planet (UNEP, 2021).

### Global importance of biodiversity

Biodiversity plays a crucial role in the stability and resilience of ecosystems. It influences air quality, water supply, soil fertility and food production. Ecosystem services such as insect pollination, natural pest control and carbon storage are closely linked to intact biodiversity (IPBES, 2019).

### Global threats to biodiversity

Biodiversity is under massive threat worldwide. The main factors are the destruction of natural habitats through agriculture and urbanisation, climate change, pollution and the overuse of natural resources. According to the report of the World Biodiversity Council (IPBES, 2019), more than a million species are threatened with extinction – with far-reaching consequences for humans and the environment.

### Why is biodiversity important in Europe?

Biodiversity loss is also a serious problem in Europe. Intensive agriculture, soil sealing and climate change are affecting many species and habitats. According to the European Environment Agency (EEA, 2020), about 80% of habitats are in poor condition. Yet Europe's landscapes are rich in biodiversity, which is not only important for the environment, but also for the economy and society. The European Union has developed various strategies and protective measures to counteract this trend, including the Biodiversity Strategy 2030 (European Commission, 2020).

### The aim of this document

This document provides an overview of the different levels of biodiversity, their importance and the main threats in Europe. It highlights the measures needed to conserve biodiversity and gives a specific example from European agriculture – the creation of flower strips – as a viable solution for promoting biodiversity.

This basis is used to illustrate why the protection of biodiversity is not only an ecological necessity, but also a social and economic one.

## 2. Levels of biodiversity

Biodiversity exists at different levels, which influence each other and together contribute to the stability of ecosystems. The three main dimensions of biodiversity are genetic diversity, species diversity and ecosystem diversity.

### Genetic diversity

Genetic diversity describes the variation within a species. This diversity enables populations to adapt to changing environmental conditions and to be resistant to diseases or other threats. For example, agricultural crops with high genetic diversity are more resistant to pests and climate change (FAO, 2019). However, the decline in genetic diversity due to monocultures or overbreeding endangers the adaptability of many species.

### Species diversity

Species diversity refers to the number of different species in a given area. It is an essential factor for stable and resilient ecosystems, as different species perform different functions, such as pollination, nutrient cycling or pest control. According to the Global Biodiversity Outlook (UNEP, 2021), biodiversity is declining rapidly worldwide. Insects, which play a key role in ecosystems, are particularly affected.

### Ecosystem diversity

Ecosystem diversity refers to the variety of different habitats on Earth, from tropical rainforests to deserts, marine ecosystems and temperate forests. Each ecosystem provides specific living conditions for the species living in it and contributes to global biodiversity. In Europe, many ecosystems are threatened by human intervention, such as the conversion of wetlands into agricultural land or the destruction of forests for urban development (EEA, 2020). Maintaining biodiversity at all these levels is essential for the balance of nature and the well-being of humanity. The next chapters will discuss the importance of biodiversity, the threats to it, and the protective measures in place, particularly in Europe.

## 3. The importance of biodiversity

Biodiversity is of fundamental importance for the ecological balance, economic development and social well-being of society. Its significance can be divided into three main areas:

### Ecological functions

High biodiversity is essential for ecosystems to function properly. It influences processes such as pollination, water balance, soil fertility and climate. Species diversity within an ecosystem ensures greater resilience to environmental changes and helps to maintain ecological balances. According to

IPBES (2019), up to 75% of the world's food crops depend on insect pollination. The decline in biodiversity thus directly affects food production and can endanger human food security.

### Economic importance

Biodiversity plays a central role in many economic sectors. It is the basis for agriculture, fisheries and forestry. It also provides important resources for the pharmaceutical industry – around 70% of modern medicines are based on natural compounds (WHO, 2020). Tourism also benefits from an intact natural environment, as nature reserves, national parks and biodiversity hotspots are valued as tourist destinations. According to the EU Commission (2020), the nature tourism industry in Europe generates billions in revenue annually and creates numerous jobs.

### Cultural and social aspects

Biodiversity is deeply rooted in the culture and history of many societies. It influences traditions, religions and ways of life. In many indigenous communities, the preservation of biodiversity is essential for survival and cultural identity. In addition, an intact environment contributes to mental and physical health by providing space for recreation. Studies show that spending time in natural surroundings reduces stress and increases well-being (EEA, 2020). Biodiversity is thus not just an environmental factor, but an essential basis for human life and economic activity. Its protection is therefore a task for society, combining ecological, economic and social aspects.

## 4. Ecosystem services

Ecosystem services are the direct and indirect contributions of ecosystems to human well-being. They include all the benefits that people derive from nature and are essential for the functioning of the environment, society and the economy. According to the Millennium Ecosystem Assessment (MEA, 2005), they can be divided into four main categories:

### Provisioning services

These include material resources obtained directly from nature:

- **Food:** fruit, vegetables, fish and meat from natural and agricultural systems.
- **Raw materials:** wood for construction and paper, natural fibres for textiles.

### Regulating services

These include natural processes that maintain ecological balance:

- **Carbon storage:** forests and oceans bind CO<sub>2</sub> and regulate the climate.
- **Water purification:** Wetlands and soil organisms filter pollutants from watercourses.

## Cultural services

Non-material benefits that influence human well-being:

- **recreation and tourism:** National parks and nature reserves as places of recreation.
- **aesthetic values:** The beauty of natural landscapes inspires art, religion and spirituality.

## Supporting services

Fundamental processes that enable all other ecosystem services:

- **Pollination:** wild bees and other insects pollinate plants and ensure crop yields.
- **Nutrient cycling:** microorganisms in the soil decompose organic material and provide nutrients.

These ecosystem services are essential for human well-being, economic activity and the stability of natural processes. Their preservation is therefore a key task for nature conservation and sustainable development (MEA, 2005).

## 5. Threats to biodiversity

Biodiversity is exposed to numerous threats worldwide that endanger its stability (IPBES, 2019). Based on the International Union for Conservation of Nature (IUCN) Red List, it is estimated that 1 million species globally may be threatened with extinction (UN, 2023). The main threats to biodiversity are:

### Habitat destruction

The conversion of natural areas into agricultural, residential or industrial areas results in the loss of habitats for numerous species. In Europe, wetlands, forests and species-rich meadows are particularly affected. According to the European Environment Agency (EEA, 2020), large areas of natural landscapes have been destroyed for agricultural and urban purposes in recent decades.

### Climate change

Climate change is altering temperature and precipitation patterns worldwide, affecting habitats and species. Many animal and plant species are unable to adapt quickly enough and are being displaced into new areas or are dying out. Sensitive ecosystems such as mountain regions, wetlands and coastal areas are particularly affected (IPCC, 2021).

### Overuse of resources

The intensive use of natural resources, for example through overfishing, intensive logging or overgrazing, endangers biodiversity. Many fish stocks are overfished due to unsustainable practices, which has a serious impact on marine ecosystems. Wildlife is also hunted excessively in many regions, leading to the decline of endangered species (FAO, 2020).

## Environmental pollution

Pollutants such as pesticides, plastic waste and industrial wastewater have negative impacts on biodiversity. Pesticides contribute to the decline of pollinating insects, while plastic pollution is particularly threatening to marine life. Microplastics have already been detected in numerous species, including fish, birds and even mammals (UNEP, 2021).

These threats show that the protection of biodiversity is more urgent than ever. In the next section, we will look at measures for conserving biodiversity.

## 6. Measures for protecting biodiversity

To stop the loss of biodiversity and preserve natural habitats, targeted protective measures are needed. The most important strategies include:

### Nature reserves

The protection of ecosystems through national parks, biosphere reserves and Natura 2000 sites contributes significantly to the preservation of biodiversity. In Europe, there are over 27,000 protected areas, which together make up almost 18% of the land area (EEA, 2021). These areas provide safe havens for endangered species and protect valuable habitats from destruction.

### Sustainable agriculture and forestry

Agriculture and forestry play a crucial role in maintaining biodiversity. The most important measures include:

- **Organic farming:** avoiding chemical pesticides and fertilisers and promoting crop rotation to increase soil fertility.
- **Agroforestry:** combining trees and agriculture to promote biodiversity.
- **Sustainable forestry:** management of forests with due regard for natural growth cycles and the protection of endangered species.

### Legal regulations and international agreements

Various legal measures and international agreements are crucial for the preservation of biodiversity:

- **EU Biodiversity Strategy 2030:** The EU's goal is to protect at least 30% of land and sea by 2030.
- **Kunming-Montreal Global Biodiversity Framework (2022):** This international agreement was adopted as the successor to the Convention on Biological Diversity (CBD). It includes ambitious targets to restore ecosystems, protect 30% of the world's land and sea areas, and reduce pollutants and invasive species.
- **Washington Convention on International Trade in Endangered Species (CITES):** Regulates international trade in endangered species to curb poaching and illegal markets.

These exemplary strategies help to halt the loss of biodiversity and preserve sustainable habitats. The next section takes a closer look at the EU Biodiversity Strategy 2030.

## 7. EU Biodiversity Strategy for 2030 - targets and implementation measures

The EU Biodiversity Strategy for 2030 is a key initiative of the European Green Deal and aims to halt the loss of biodiversity and restore natural ecosystems. It is based on four pillars and contains ambitious targets for the re-naturalisation, protection of habitats and sustainable use of natural resources.

### Main objectives of the strategy

The following goals are to be achieved by 2030:

#### Protect nature in the EU (EU Nature Protection Plan)

- 30% of the EU's land and marine areas are to be placed under protection
- 10% of areas will be given strict protection status, including primeval forests, moors, seagrass meadows and other carbon storage ecosystems.
- Trans-European Nature Network: Creating a coherent network of protected areas through ecological corridors.
- improve the management of all protected areas through clear protection measures and regular monitoring.

#### Restoration of nature in the EU (EU Nature Restoration Plan)

- legally binding restoration targets for ecosystems by 2021 (already adopted as "Nature Restoration Law").
- at least 20 % of degraded ecosystems will be restored by 2030.
- comprehensive re-naturalisation measures:
- Restoration of 25,000 km of free-flowing rivers.
- Reforestation with 3 billion trees, taking ecological principles into account.
- Conversion of 10 % of agricultural land into biodiversity-rich landscapes (e.g. hedges, flower strips, wetlands).
- 50% less chemical pesticides and fertilisers to protect pollinators and soil quality.
- protect marine ecosystems, reduce overfishing and limit destructive fishing practices.

#### Transformation of the economy and society

- sustainable financing: At least 20 billion euros per year from EU, national and private funds for biodiversity measures.

- Biodiversity criteria for investments and subsidies as part of the EU taxonomy for sustainable finance.
- green infrastructure in cities: Cities with over 20,000 inhabitants should develop "Urban Greening Plans".
- improve environmental education through new educational initiatives and vocational retraining for sustainable professions.

### **Global biodiversity agenda**

- leading role for the EU in global biodiversity negotiations (including the UN Convention on Biological Diversity, CBD).
- curbing deforestation worldwide, including measures against the import of products from deforestation.
- strengthening the EU action plan against wildlife crime.

### **Detailed measures for implementation**

#### **EU Nature Protection Plan - protecting nature**

The protection of biodiversity is of central importance, as 81% of protected habitats and 63% of species are in a poor conservation status (State of Nature Report, 2020). Important measures:

- expand protected areas: From the current 26 % of land and 11 % of marine areas to 30 % in both categories.
- designate strictly protected areas: At least 10 % of the EU area should be absolutely protected (e.g. primeval forests, moors, seaweed meadows).
- coherent network: Creation of a "Trans-European Nature Network" to connect isolated nature conservation areas.

#### **EU Nature Restoration Plan - restoring nature**

- Re-naturalisation measures for damaged ecosystems in agricultural, forestry and urban areas.
- Restoration of river landscapes: 25,000 km of free-flowing rivers.
- Promotion of sustainable agriculture with biodiversity-friendly measures (e.g. agroforestry, less pesticides).
- Reforestation with 3 billion trees - from an ecological point of view, not as monocultures.
- 50% reduction in the use of pesticides to save pollinators.
- Sustainable financing and management

- Provision of at least 20 billion euros per year from various EU funds, national funds and private investment.
- focus EU funding on biodiversity: Introduction of environmental and social criteria in investment decisions ("biodiversity proofing").
- Introduction of an EU-wide indicator system to measure progress in biodiversity.

#### International measures

- support for the United Nations' global biodiversity framework (CBD).
- add biodiversity requirements to trade agreements to combat deforestation and environmental degradation in third countries.
- strengthening the EU action plan against wildlife trafficking.

With its comprehensive approach, binding targets and substantial financial resources, the strategy is a decisive step towards preserving Europe's natural environment for future generations.

## 8. EU Financing Modalities for Agroecological Practices

Agroecological practices such as organic farming, agroforestry, crop diversification, and pest management through integrated management are central to the EU's transition towards sustainable agriculture. To promote their adoption, the EU funds them through a variety of financing instruments, including region-specific programmes:

#### Common Agricultural Policy (CAP)

The Common Agricultural Policy (CAP) is the EU's primary tool for supporting farmers. In its 2023–2027 setup, agroecological practices are prioritized through:

- **Pillar 1 (Direct Payments):**
  - Eco-schemes: Farmers are rewarded with payments for adopting measures like crop rotation, reduced pesticide use, or maintaining non-productive land (e.g., flower strips). In 2023, 25% of Pillar 1 funds (€20 billion annually) was funded by eco-schemes (EU Commission, 2023).
- **Pillar 2 (Rural Development):**
  - Agri-environment-climate actions (AECM): European Agricultural Fund for Rural Development (EAFRD) co-funded, AECM assists with long-term commitment to agroecology. Subsidies for example include organic certification, agroforestry regimes, or conservation of soil.
  - Young Farmers Scheme: Further grants to young farmers going agroecological.

## Regional Implementation of Rural Development Programmes (RDPs)

Member states of the EU prepare Rural Development Programmes (RDPs) at regional level to address local environmental and agricultural challenges. RDPs are co-funded by the EU (via EAFRD) and national/regional authorities. Key features are:

- **Tailored Agroecological Priorities, here some examples:**
  - For Andalusia, Spain, RDPs fund water-saving agroecological interventions (e.g., drip irrigation and drought-resistant crops) to combat desertification.
  - Bavaria, Germany prioritizes agroforestry and hedgerow rehabilitation to enhance biodiversity in intensive farming.
  - Tuscany, Italy supports organic olive and vineyards to improve soil nutrient content and sequester carbon.
- **Decentralized Management:**
  - Regional stakeholders (farmers' cooperatives, NGOs) coordinate with local administrations to create intervention measures that adhere to EU ambitions while addressing localized requirements.
  - Wales (UK), RDP funding is allocated to small agroecological farms under the Glastir scheme.
- **Funding Mechanisms:**
  - Grants and Subsidies: Agroecological infrastructure (greenhouses, composting systems, etc.) receiving 80% co-financing.
  - Technical Support: Capacity-building training for agroecological practices, typically delivered via local agricultural extension services.
  - Results-Based Payments: Compensation of farmers for measurable outputs like increased numbers of pollinators or decreased soil erosion.

## LIFE Programme

The **LIFE Programme** is the European Union's central funding instrument for the environment and climate action. Since its launch in 1992, it has co-financed more than 5,500 projects and mobilised over € 12 billion for environmental and climate action. An important sub-programme is the '**Nature and Biodiversity**' sub-programme, which specifically supports the preservation and restoration of biodiversity in Europe ([CINEA, 2023](#)).

### Objectives of the Nature and Biodiversity sub-programme

The sub-programme has the following main objectives:

- Supporting the implementation of the **EU Biodiversity Strategy for 2030** by protecting endangered species and ecosystems.
- Financing projects to **restore damaged habitats**, particularly in the Natura 2000 network.
- Promoting innovative **nature conservation solutions** and new management approaches for the preservation of biodiversity.

### Financing and funding volume

For the **2021–2027** period, the LIFE programme has been allocated a total budget of **5.4 billion euros**. Of this, at least **2.1 billion euros** are earmarked for the sub-programme ‘Nature and Biodiversity’ ([ZUG, 2023](#)).

### Funding priorities

The LIFE sub-programme supports various measures, including:

- **Species and habitat conservation:** Funding of projects to stabilise endangered populations and protection measures for rare animal and plant species.
- **Ecosystem restoration:** Measures to restore rivers, wetlands, forests and marine ecosystems.
- **Nature conservation innovations:** Development of new monitoring methods, sustainable management strategies and innovative environmental protection measures.

### Examples of funded projects

- **Reintroduction of endangered species:** funding of conservation programmes for European wildcats and brown bears.
- **Restoration of wetlands:** financing of projects to restore moors as carbon stores.
- **Biodiversity-friendly agriculture:** funding of agro-ecological approaches to reduce pesticide use and create biodiversity-friendly landscapes.

### Implementation and advice

At the national level there are certain institutions who are taking care of the implementation and giving advice. For example, in Germany, the LIFE programme is managed by **Zukunft – Umwelt – Gesellschaft (ZUG) gGmbH**, which acts as the national contact point and provides support for applicants ([ZUG, 2023](#)) or in Italy it is mainly managed by the **Ministero de’l Ambiente e della Sicurezza Energetica** ([MASE, 2024](#))

### Significance of the LIFE sub-programme for nature conservation

The LIFE programme plays a crucial role in implementing EU environmental policy. With its substantial funding, it contributes to **the sustainable protection and improvement of biodiversity in Europe**. It is one of the few EU funding programmes that is directly geared to nature conservation and thus makes a significant contribution to achieving Europe's biodiversity targets.

## Horizon Europe

**Horizon Europe** research program invests money to promote agroecology through:

- Cluster 6 (Food, Bioeconomy): Funding R&D on soil fertility, circular farming, and low-input farming (€8.95 billion for 2021–2027).
- Partnerships: Collective efforts like the European Partnership on Agroecology bring farmers, scientists, and policymakers together to upscale best practices.

## European Green Deal Initiatives

- Farm to Fork Strategy: Aims for a minimum 25% EU arable land dedicated to organic farming by 2030, based on CAP strategic national plans.
- Carbon Farming Initiative: Encourages agroecological approaches fixing carbon (agroforestry, cover cropping) via performance-based payment.

## Challenges and Opportunities

EU finances are considerable but also some still lingering barriers:

- Perplexing bureaucracy: Tiny farmers will be incapable of engaging application processes.
  - Regional Solutions: Some regions, e.g., Wallonia (Belgium), simplify applications by single-stop online platforms for CAP and RDP funds.
- Regional disparities: Unequal access to funds in member states.
  - EU Support: The CAP Network helps with harmonising regional implementation and sharing of best practices (e.g., the Agroecology Living Labs initiative).

The next section looks at how humans can directly contribute to the preservation of biodiversity.

## 9. Biodiversity and humans

Humans influence biodiversity in a variety of ways – both negative and positive (IPBES, 2019). While industrial development, agriculture and urbanisation often lead to the destruction of habitats, there are also numerous measures that can be taken to promote and preserve biodiversity.

### Human impact on biodiversity

Humans interfere with ecosystems both directly and indirectly. Negative impacts include:

- **Habitat destruction:** Deforestation, urbanisation and infrastructure measures such as road construction lead to the loss of natural habitats.
- **Pollution:** Pollutants such as plastics, pesticides and heavy metals endanger many species and ecosystems.
- **Climate change:** Changes in temperatures and precipitation patterns threaten sensitive habitats.
- **Overuse of resources:** Overfishing, poaching and unsustainable agriculture are contributing to the extinction of species.

At the same time, however, there are many positive human influences that contribute to the preservation of biodiversity, including:

- **Restoration projects:** reforestation, protection of wetlands and restoration of riverine landscapes.
- **Conservation measures:** establishment of protected areas, sustainable management and species protection programmes.
- **Education and awareness:** raising awareness of biodiversity through environmental education, scientific research and political action.

### Sustainable use of biodiversity

There are numerous ways in which societies and individuals can contribute to the conservation of biodiversity:

- **Sustainable consumption:** Buying organic products, FSC-certified wood and sustainably caught fish supports the conservation of biodiversity.
- **Promoting sustainable agriculture:** Programmes to promote flower strips, crop rotation and agro-ecological methods help to maintain species diversity in agricultural landscapes.
- **Reducing our ecological footprint:** By using fewer resources, reducing waste and choosing sustainable forms of transport, everyone can help to protect natural habitats.
- **Involvement in environmental organisations:** Nature conservation organisations offer numerous opportunities for active participation in biodiversity projects.

A conscious and sustainable approach to biodiversity is crucial for the future of our planet. The next chapter is dedicated to an example for a specific measure in agriculture to promote biodiversity.

## 10. Flower strips in agriculture – a practical example

Flower strips are purposefully created, perennial or annual plant strips, usually consisting of a mixture of native wild and cultivated plants. They are integrated into agricultural landscapes to promote species diversity and improve ecological functions.

### Environmental benefits of flower strips

Flower strips offer numerous environmental and biodiversity benefits:

- **Promoting pollinators:** Flower strips provide habitat and food sources for wild bees, butterflies and other pollinators that are essential for agriculture.
- **Increasing soil fertility:** Through deep rooting, they improve the soil structure and promote microorganisms that contribute to humus formation.
- **Natural pest control:** Flower strips are home to beneficial insects such as ladybirds and lacewings, which control pests such as aphids.
- **Climate regulation:** They help to stabilise the water balance and counteract erosion.

### Challenges and implementation in practice

Although flower strips offer numerous advantages, there are challenges to their implementation:

- **Availability of land:** Farmers must be willing to provide arable land for flower strips, which can mean economic losses.
- **Maintenance:** flower strips require regular maintenance to ensure optimal species composition and functionality.
- **Economic incentives:** many farmers depend on funding programmes to compensate for the loss of income.

### Funding opportunities and political support

In Europe, there are various funding programmes to support the creation of flower strips:

- **EU agricultural policy (CAP):** Flower strips can be funded as part of agri-environmental measures.
- **National and regional programmes:** Many countries have special subsidies for biodiversity-promoting measures in agriculture.
- **Voluntary initiatives:** Nature conservation organisations and private companies support farmers in creating and maintaining flower strips.

Flower strips are an effective example of a practical measure for promoting biodiversity. They show how nature conservation and agriculture can be successfully combined to create long-term sustainable solutions.

## 11. Conclusion and outlook

The preservation of biodiversity is one of the greatest challenges of our time. The threats posed by habitat destruction, climate change, environmental pollution and the overuse of natural resources are serious, but there are promising approaches to counteract them.

### Summary of the main findings

- Biodiversity is essential for stable ecosystems and human well-being.
- The greatest threats are human activities such as land-use changes, pollution and climate change.
- Protective measures such as nature reserves, sustainable agriculture and international agreements are crucial for maintaining biodiversity.
- Practical approaches such as flower strips in agriculture show how biodiversity promotion can be integrated into existing economic systems.

### Future prospects

To conserve biodiversity in the long term, political, economic and social efforts must be intensified. The following measures could contribute to this:

- **Stronger political framework conditions:** Concrete implementation strategies for biodiversity agreements such as the Kunming-Montreal Global Biodiversity Framework must be developed and consistently enforced.
- **Economic incentives for biodiversity protection:** Financial support for sustainable agriculture and the protection of natural habitats must be further expanded.
- **Education and training:** Greater awareness of the value of biodiversity in schools, universities and society at large can help to promote more sustainable decisions.
- **Technological innovations:** The use of new technologies such as remote sensing and artificial intelligence can help to detect changes in ecosystems at an early stage and to take targeted countermeasures.

Biodiversity is a central foundation of life on earth. Its protection requires collaborative and long-term action to maintain a balanced relationship between humans and nature. Now is the time to act – for a future in which humans and nature can coexist in harmony.

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# Greening Agrifood in Social Economy

Capacity building on Greening Agrifood in Social Economy

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## Local markets

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## Abbreviations

|      |                                 |
|------|---------------------------------|
| AFN  | Alternative Food Networks       |
| CAP  | Common Agriculture Policy       |
| CSA  | Community-supported agriculture |
| FM   | Farmer Market                   |
| GHG  | Greenhouse gas                  |
| OFN  | Open Food Network               |
| SFSC | Short food supply chains        |

## 1. Local food markets

At the turn of the twenty-first century, food safety scandals and concerns emerged, prompting consumers to prioritize healthier and more sustainable food options. This shift has brought short food supply chains (SFSCs) and alternative food networks (AFNs) into the spotlight. In recent years, SFSCs have rapidly evolved and become a focal point of scientific and political discourse. Furthermore, the rise of modern supply chains has diminished the connections and communication between consumers and producers, resulting in increased information asymmetry and a decline in consumer trust. Localized, shorter, and more economically (higher prices for producers), socially (direct interactions between producers and consumers), and environmentally (reduced transportation distances) sustainable supply chains present potential solutions to these challenges, positioning SFSCs as viable alternatives to global supply chains. The support of consumers and policymakers is crucial for the success of these initiatives. Both the European Union's Common Agricultural Policy (CAP) and the United States' Farm Bill promote the proliferation of short supply chains. Various forms of SFSCs exist, including farmers' markets (FMs), community-supported agriculture (CSA), box schemes, farm shops, farm-based butchers, cooperatives, and other initiatives. While the diversity of SFSCs is acknowledged, FMs represent the most prevalent and popular type of SFSC today. FMs have historically served as a traditional method of food retailing and remain a significant sales channel in certain regions, particularly in developing and Mediterranean European countries. In contrast, traditional FMs have largely vanished in Anglocentric nations (the United States, the United Kingdom, Australia, Canada, and New Zealand) due to the rise of supermarkets. Nevertheless, modern FMs began to emerge in the 1970s, marking the resurgence of a new generation of farmers' markets.

## 2. Socio-economic and environmental impact of local food market

The engagement in FMs presents a multitude of benefits for both producers and consumers involved, serving as a potential remedy for challenges related to social, economic, and occasionally environmental sustainability [1, 2].

Consumers benefit from access to predominantly fresh, high-quality, and healthy local products at competitive prices, often perceived as lower, while enjoying the unique atmosphere and experience that FMs offer. Contrary to the common belief that prices at FMs are low, many consumers are willing to pay a premium for local goods. Furthermore, the transparency and trust established through these markets are highly valued, allowing customers to forge deeper connections and

providing a communal space for friends and neighbours. FMs may also help consumers learn more about local products, production methods, and sustainable growing practices.

## 2.1 Social impact

Socially, FMs can help to rebuild connections within rural and urban areas while also promoting health benefits, such as improved access to fresh fruits and vegetables in larger communities. Farmers gain the opportunity to better understand their consumers and fellow producers, fostering the exchange of experiences, particularly in marketing and business practices [2].

By contributing to a healthy society through their work, individuals experience a sense of recognition, which subsequently enhances their own well-being.

There are primarily two significant methods by which FMs can enhance farmers' sense of acknowledgment. The first method involves traceability, which refers to the capacity to ascertain the origins and production processes of a product. This aspect is fundamental to FMs, as it allows consumers to appreciate the contributions of farmers and various stakeholders throughout the supply chain, including those who are often overlooked, such as women. Consequently, traceability empowers consumers to make educated decisions regarding their food, thus facilitating their active involvement in the development of inclusive food systems. Secondly, consumers might exhibit heightened interest in the production methods and limitations associated with food purchases in farmers' markets. This growing curiosity regarding agri-food systems could lead to broader behavioural shifts, such as a desire to share skills and participate in civic engagement. Recognizing such changes may enhance farmers' sense of value regarding their social contributions. Nevertheless, when Local Food Systems (LFS) lack direct interaction between producers and consumers, it restricts the opportunities for re-establishing connections, as mutual acknowledgment relies on both psychological and physical engagements.

## 2.2 Economic impact

FMs facilitate direct sales from vendors to consumers, often providing a lucrative alternative to the lower prices found in commodity markets, such as supermarkets, which are linked to industrial agriculture. The financial resources retained within the local economy can support local wages, the acquisition of regional products, and overall economic development. Additionally, FMs frequently contribute to increased employment and local tax revenues.

Furthermore, consumers are willing to pay premium for local over non-local food products.

There are three primary factors that may elucidate how farmers can achieve economic benefits from selling in farmers' markets at an individual level. Firstly, although the ultimate value of a product is typically established through the collaborative contributions of various participants within the supply chain, the allocation of the value-added among these participants is influenced by the internal governance framework and the dynamics of bargaining power. In accordance with principal-agent theory, agents, or participants in the supply chain, can enhance their bargaining power by minimizing their reliance on others. In farmers' markets, farmers can accomplish this in two distinct manners. One approach is through direct sales to consumers, which may result in a

price premium compared to longer supply chains, as farmers have the autonomy to determine their own prices. The second approach involves the integration of multiple distribution channels, including those associated with niche markets for specialty products (e.g., local branding). This strategy also serves as a means of diversification, thereby mitigating the economic risks linked to reliance on a singular distribution channel. Secondly, transaction cost theory posits that every selling arrangement incurs coordination costs related to the decision-making, planning, and negotiation processes involved in the sale. While transaction costs are likely to be particularly elevated in direct channels due to the numerous individual transactions necessitated, they may be comparatively lower in traditional local channels owing to economies of scale. Furthermore, the existing literature on firm capabilities and learning indicates that cultivating the ability to effectively participate in specific supply chain activities can be quite challenging and time-intensive. For farmers engaged in Short Food Supply Chains (SFSC), the internalization of processing and marketing functions may consequently lead to increased expenses associated with skill development and additional labor needs.

## 2.3 Environmental impact

Due to the nature of local sales, food typically does not travel long distances, resulting in fewer food miles compared to the logistics employed by supermarkets. Moreover, there are claims of reduced packaging waste and fertilizer usage, as well as a decrease in food waste.

Food miles, defined as the distance food travels from producer to consumer, are posited to play a role in alleviating climate change. It is reasonable to infer that minimizing food miles could lead to a reduction in greenhouse gas (GHG) emissions linked to food transportation, thereby lessening the overall effects on climate change [1].

Farmers who directly interact with consumers upon their request are often encouraged to diversify their production in terms of the number of crop varieties grown.

Alternative Food Networks are advocating for agro-ecological methods, which encompass polyculture practices and the growing of traditional fruit and vegetable varieties.

Organic farmers tend to sell a greater portion of their produce through SFSC compared to their non-certified counterparts. Conversely, those who engage in SFSC are more likely to possess organic certification. These findings may suggest variations among countries regarding the relationship between SFSC and organic agriculture.

Furthermore, often there is a high associated biodiversity maintained around diverse farms participating in SFSC.

### 3. Consumer attitude

Food quality, pricing, and the market environment, particularly social interactions, serve as the main draws of FMs. Customers who prioritize these aspects typically exhibit distinct socio-demographic traits. Consumers attend farmers' markets to purchase fresh produce. Research indicates that women frequent FMs more than men, likely due to their role as the primary food buyers in many households. Although there is considerable variation in customer age across different countries and continents, the average FM patron is generally between the ages of 35 and 55. Furthermore, individuals who show an interest in FMs tend to possess higher educational qualifications than the general population, a trend that is prevalent across various short food supply chains (SFSCs). Analysing the income levels of FM customers presents significant challenges, yet it remains a common topic in academic discussions. Most research suggests that FM consumers predominantly belong to the middle or upper-middle class [1, 2].

The attributes of consumers that notably enhance the likelihood of attending a farmers' market specifically for the purpose of acquiring produce include the frequency of visits, educational attainment, health or dietary concerns, passion for agriculture, income exceeding the average of the sample, being the primary shopper, readiness to participate in a Community Supported Agriculture (CSA) program, engagement in home gardening, and the demographic of married women.

## 4. Connecting Fields to Forks - The Vital Role of Local Markets

Across the diverse agricultural landscapes of Europe, farmers work tirelessly to cultivate the food that sustains communities. While large-scale agriculture often dominates headlines, a significant portion of Europe's food production comes from smaller farms. In fact, over three-quarters of farms within the European Union operate on less than 10 hectares. These smaller agricultural holdings are not just picturesque elements of the rural scenery; they are vital contributors to food security, regional economies, and the preservation of traditional farming practices. However, these farmers often face significant challenges in bringing their produce to consumers, particularly when navigating complex, lengthy supply chains dominated by large distributors and retailers. Connecting directly with local markets offers a crucial pathway for these farmers to achieve fair prices, build sustainable businesses, and strengthen their connection with the communities they feed.

### 4.1 Challenges in Traditional Supply Chains

The journey from farm to table can be long and convoluted in conventional food systems. Produce often travels vast distances, passing through multiple intermediaries – processors, packers, wholesalers, and retailers – before reaching the consumer. While efficient in some respects, this model frequently disadvantages the primary producer. Farmers may receive only a small fraction of the final price paid by the consumer, squeezed by the negotiating power of larger players in the chain. Furthermore, long supply chains can lead to reduced freshness, loss of traceability, and a disconnect between consumers and the origins of their food. The economic pressures, coupled with difficulties in accessing land and the increasing impacts of climate change, have unfortunately led to the decline of many small farms across Europe in recent decades, highlighting the urgent need for alternative, more direct routes to market.

### 4.2 The Rise of Local Food Systems

In response to these challenges, and driven by growing consumer interest in food provenance, quality, and sustainability, local food systems are experiencing a resurgence across Europe. Consumers are increasingly seeking out fresh, seasonal produce with a clear origin story, valuing the connection to local farmers and the reduced environmental impact often associated with shorter supply chains. This shift is further supported by policy initiatives, such as the EU's Farm to Fork strategy, which explicitly aims to redesign food systems to ensure fair economic returns for primary producers and promote sustainable food production. Events like the COVID-19 pandemic and geopolitical instability have also underscored the importance of resilient, localized food supplies, further boosting interest in strengthening connections between local farmers and consumers.

## 5. Pathways to the Local Market

Fortunately, European farmers have a growing number of avenues to access local markets and sell their products more directly. These approaches vary in scale and method, offering options to suit different types of farms and products. Traditional methods like selling at physical farmers' markets remain popular, providing direct interaction with customers. Direct sales from the farm gate or through farm shops offer another personal connection. Increasingly, farmers are collaborating through local food associations or cooperatives, pooling resources for marketing, distribution, or even processing. Public procurement, where institutions like schools and hospitals source food locally, presents a significant opportunity. Furthermore, the digital age has opened up new possibilities through online platforms and digital tools, enabling farmers to reach local customers efficiently. These platforms range from individual online shops to collaborative virtual farmers' markets.

### 5.1 Exploring the Options

This section aims to guide European short food chain actors through the various options for accessing local markets. The actors in the short food chain are farmers, local shops, small distributors. This first section introduces the importance and context of local food systems. The subsequent sections will delve deeper into specific strategies and tools available. Section 2 will explore the landscape of digital platforms and other innovative tools, including detailed examples like the Open Food Network and The Food Assembly (La Ruche qui dit Oui!), explaining how they function and the benefits they offer. Section 3 will provide practical examples of how farmers can implement various local selling strategies. By understanding the available pathways, farmers can identify the strategies that best fit their business goals and contribute to building a more resilient, fair, and sustainable food future for Europe.

#### *Digital Fields - Platforms and Tools for Local Market Access*

##### *Leveraging Technology for Direct Sales*

The digital revolution has profoundly impacted how we connect, communicate, and conduct business, and the agricultural sector is no exception. For European farmers seeking to tap into local markets, a growing array of digital platforms and tools offer powerful ways to bypass traditional intermediaries, connect directly with consumers, manage sales efficiently, and build resilient businesses. These technologies range from comprehensive online marketplace software to simpler communication tools, each providing unique advantages for reaching local customers and streamlining operations. While traditional methods like farmers' markets and farm gate sales retain their importance, digital tools can significantly amplify a farmer's reach and efficiency, making local sales a more viable and profitable option.

### *Online Marketplaces and Food Hub Platforms*

One of the most significant developments is the emergence of dedicated online platforms designed specifically for local food systems. These platforms act as virtual marketplaces, enabling farmers to list their products, manage orders, and coordinate distribution, often collectively with other local producers. Two prominent examples operating across Europe are the Open Food Network and The Food Assembly (La Ruche qui dit Oui!).

#### **Open Food Network (OFN)**

The Open Food Network operates as a global, non-profit, open-source project with a strong presence in several European countries (UK, France, Belgium, Germany, Italy, Spain, etc.). Its core mission is to build a fairer, more local, and transparent food system by providing the necessary digital infrastructure.

- **How it Works for Farmers:** OFN provides flexible software allowing farmers to create their own online shopfront or join/create a local 'food hub' (a virtual market managed by a community group or wholesaler). Farmers list products, set prices, and manage stock. The software handles food-specific complexities (variable weights, units).
- **Key Features:** Direct sales management, online payment collection (Stripe, PayPal, bank transfer, cash), delivery/collection options (time slots, locations), order cycle management. Farmers can also supply other hubs on the network.
- **Benefits:** Farmer control over pricing/sales, open-source/non-profit ethos, collaboration, scalability (individual shop or hub participation).

#### **The Food Assembly (La Ruche qui dit Oui!)**

Originating in France, this platform blends online ordering with physical collection points ('Assemblies').

- **How it Works for Farmers:** Farmers list products for a specific local Assembly. Customers order online during a sales window. Farmers deliver pre-ordered goods to the Assembly point for customer collection at a weekly pop-up market.
- **Key Features:** Online ordering, payment processing, product listing tools. Each Assembly is run by a local 'Host' managing venue, customers, and producers.
- **Benefits:** Guaranteed sales (pre-ordered), waste elimination, farmer-set prices (approx. 80% return ex-VAT in French model), face-to-face customer interaction, simplified accounting/payments.

### *Other Digital Approaches*

Beyond these platforms, other tools support local sales:

- **REKO Rings:** Popular in Nordic countries, operating via closed Facebook groups. Producers post, customers order via comments, meet for quick handover at a set time/place. Low-cost, direct, pre-order model.

- Specialized E-commerce Platforms: Commercial platforms tailored for farm sales (e.g., Local Line, Barn2Door - availability varies). Offer inventory management, CRM, logistics features (often subscription-based).
- Community Supported Agriculture (CSA) Software: Platforms to manage CSA subscriptions, payments, and communication.
- Direct Online Shops: Standalone websites using general platforms (Shopify, WooCommerce, Squarespace). Require more setup, lack food-specific network effects.
- Social Media & Messaging Apps: Facebook pages, Instagram shops, WhatsApp groups for direct marketing, announcing availability, taking orders (suited for smaller scale/tight-knit communities).

## 5.2 Choosing the Right Tools

The best digital approach depends on the farmer's needs, scale, technical comfort, and business model. Consider control level, target customers, admin time, budget, and collaboration interest. OFN offers flexibility/open-source ethos; The Food Assembly provides a structured community/ guaranteed sale; REKO offers simplicity; specialized platforms offer advanced features. Exploring these options helps farmers effectively reach local consumers, gain fairer returns, and contribute to a sustainable food system.

### *Practical Pathways - Examples of Selling Locally*

Understanding the concepts and platforms is the first step; putting them into practice is the next. Selling locally involves choosing the right methods for the short food chain actors, products, and target customers. Here are practical examples and considerations for various local selling strategies popular across Europe:

#### *a. Excelling at the Farmers' Market*

Farmers' markets are a cornerstone of local food systems, offering direct customer interaction.

- Preparation: Identify suitable markets in your area (check frequency, opening times, stall fees, typical customer base). Apply for a stall, ensuring you meet any local regulations or market rules (e.g., regarding product origin, insurance).
- Presentation: Create an attractive stall. Use clean tablecloths, clear signage with your farm name and location, and display produce appealingly (e.g., in baskets, crates). Consider offering samples if permitted.
- Pricing: Research prices at the market but price based on your costs and desired margin. Use clear price labels. Offer deals for bulk purchases or end-of-day sales to minimize waste.
- Engagement: Be friendly and knowledgeable. Talk to customers about your farm, how produce is grown, and offer cooking suggestions. Build relationships – regular customers are valuable.
- Logistics: Plan transport, setup/takedown time. Bring appropriate change, consider a card payment reader (like SumUp or Zettle) for convenience.

### *b. Setting Up Farm Gate Sales or a Farm Shop*

Selling directly from your farm creates a strong connection.

- **Setup:** Designate a clear area. If unmanned (honesty box), ensure its secure and weatherproof. For a staffed shop, make it welcome. Clear signage from the road is crucial.
- **Product Range:** Offer your core products. Consider adding value-added items (jams, juices) or complementary products from neighbouring farms (with agreement).
- **Operations:** Decide on opening hours. For honesty boxes, have clear instructions and a secure payment box. For staffed shops, ensure someone is available. Keep the area tidy and well-stocked.
- **Payment:** Honesty boxes rely on cash. Staffed shops should offer cash and card payments.

### *c. Implementing a Box Scheme / CSA Model*

These models provide predictable income and build customer loyalty.

- **Model Design:** Decide on box size(s), frequency (weekly/bi-weekly), price, and contents (farmer's choice or some customization). Define the season length.
- **Recruitment:** Market your scheme locally – flyers, social media, local events, website. Clearly explain the CSA concept (shared risk/reward).
- **Logistics:** Plan harvest schedules to meet box needs. Establish packing routines. Decide on distribution – farm collection points, local drop-off points, or home delivery (consider costs/routes).
- **Communication:** Regularly communicate with members (email newsletters are common) about what's in the box, farm news, recipes. Manage subscriptions and payments (online platforms can help).

### *d. Supplying Local Businesses (Restaurants, Retailers)*

Selling wholesale locally can provide larger, regular orders.

- **Identify Prospects:** Look for independent restaurants, cafes, pubs, greengrocers, or farm shops in your area that value local sourcing.
- **Build Relationships:** Approach chefs or owners directly. Bring samples. Understand their needs (quantity, frequency, specific products). Reliability is key.
- **Pricing & Invoicing:** Agree on wholesale prices. Establish clear invoicing and payment terms.
- **Delivery:** Plan regular delivery routes and schedules. Ensure produce arrives fresh and well-presented.

### *e. Leveraging Online Platforms Effectively*

Using platforms like Open Food Network (OFN) or The Food Assembly requires active management.

- **Listing Products:** Take good photos. Write clear descriptions. Keep stock levels updated accurately.
- **Managing Orders (OFN/Similar):** Check for new orders regularly. Prepare orders for collection/delivery according to the schedule set by you or the hub.
- **Coordinating Collections (Food Assembly/REKO):** Prepare only what's ordered. Arrive at the collection point on time. Engage with customers during the handover.
- **Communication:** Respond promptly to customer queries via the platform or other agreed channels.

### *f. Collaborative Selling Ventures*

Partnering with other local producers can increase efficiency and reach.

- **Joint Market Stalls:** Share stall costs and staffing at farmers' markets, offering a wider range of products to attract more customers.
- **Shared Delivery Routes:** Coordinate deliveries with nearby farms to reduce transport costs and time, especially for box schemes or business supplies.
- **Combined Online Shops/Hubs:** Use platforms like OFN to create a multi-producer hub, sharing administrative tasks and marketing efforts.
- **Choosing Your Path:** The most effective strategy often involves a combination of these methods. Start with what feels manageable, learn from experience, talk to other local farmers, and adapt your approach based on customer feedback and your farm's capacity.



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## Greening Agrifood in Social Economy

### Study visits about local markets in Blera and Rome, Italy

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Platform for  
Social  
Change



The event was held on 4-5-6 June 2025;

The location was in Blera (Viterbo), about 75 kilometers from Rome, at the facilities "L'olio di Blera" and the farmhouse "Mosaico oltre il Giardino".

The choice of a location other than Rome was necessary, due to the limited availability - during this jubilee year - of accommodation and because the facilities that still have accommodation possibilities have particularly high rates.

## 1. Participants:

At the study visit there were 12 participants from partner organizations. The participants were from Italy, Germany, Belgium, Romania and Ukraine.

## 2. Description of the event:

- Visit to the Blera cooperative mill (<https://oliodiblera.it/en/homepage/>)

### June 5th 2025

This oil mill is an organic oil mill with completely zero energy impact. The mill is completely new and it is composed by a cold extraction and two phases system (without water addition), situated in open countryside, in the Farm of 'Università Agraria di Blera'. The electricity used is produced by the photovoltaic system that covers the oil mill, winter heating is done with a boiler fuelled by olive pulp 'nocciolino', and the olive pulp is used for the fertirrigation of our olive groves.

The olive oil production phases begin with the harvesting of the olives, which must be done in the correct period so that they have reached the right ripeness and using suitable manual and mechanical tools so as not to damage the drupe and therefore the quality of the oil itself. After being harvested the olives are transported to the oil mill where they are weighed and recorded and then processed.

Ideally, the olives should be pressed immediately after harvesting in order to optimise their conservation. This is not always possible, so we use cracked baskets that allow complete aeration of the olives, protecting their quality.

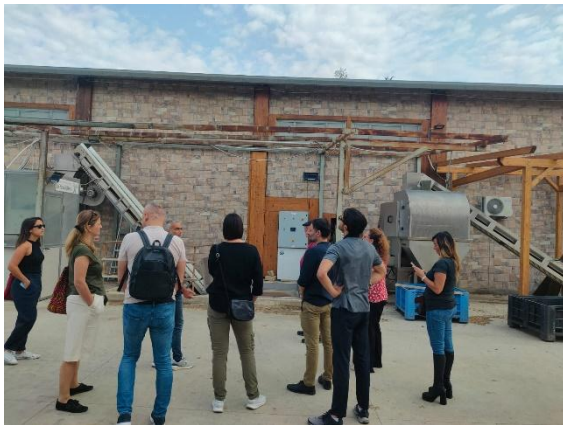
The phases of their processing can basically be divided into 5 different steps:

The washing: the olives, once arrived at the mill and weighed before being washed, are poured into a loading hopper (a sort of funnel used especially for agricultural products) whose task is to transfer all the olives to the conveyor belt that leads them to the defoliator that separates the olives from the leaves.

The crushing: the second stage involves crushing the olives to obtain a dense, creamy paste with a pungent smell. The crushing uses mechanical disks that crush the drupes without causing friction and thus avoid heating them: in

this way it avoids starting oxidation mechanisms (activated by heat) while maintaining the quality of this paste, formed by the skin, pulp and stone of the olives.

The pressing methods are: continuous cycle in modern mills and discontinuous cycle in traditional mills using granite millstones that are able to crush the olives thanks to their weight. In modern mills, on the other hand, mechanical disks are used which, rotating on the olives, allow them to be crushed and obtain a homogeneous paste in a short time, thus avoiding oxidation which could deteriorate the final product.



The paste obtained is ready for the third stage: gramolatura. The dough is transferred to the gramolatrice where, thanks to the presence of mechanical arms, it is stirred and gently heated; however, the temperature must never exceed 27/28°C. This phase is the most delicate of the entire oil production chain, because at this moment the oil-water emulsions break: the oil droplets are released from the water and form larger drops of oil that float on the water itself. This breakage takes place inside watertight tanks to protect the oil from oxidation; moreover, the gramolatura phase must be carried out in 30 minutes, otherwise there is a risk of obtaining a product with high acidity and

irreparably compromised organoleptic properties.

The pressing: is the last of the phases leading to the production of the oil; it can be hot or cold. In this step all that



is done is to separate the three components that make up the paste obtained during the gramolatura, namely:

- the oily must
- pomace
- vegetation water

- Visit to the Testaccio Farmer Market (<http://www.mercatoditestaccio.it/il-mercato/>)

June 6<sup>th</sup> 2025



At the Testaccio Market, veteran stalls alternate with more innovative offerings, revealing an authentic Rome, capable of enchanting and experimenting. Perfect for those seeking fresh, authentic, and wholesome products, it's the ultimate destination for lovers of street food, delicious dishes, and excellent raw materials. A place that surprises with its variety, where you'll always find plenty of clothing, footwear, accessories, and all kinds of household items. That's what makes it a special market: so much light, so many colors, so many smiles, and so many stalls, for all budgets and tastes.

The Market comes to life every day within a minimalist, contemporary structure, where the geometric rigor, white, and clean lines create a pleasant contrast with the colors of the goods, the liveliness of the stalls, and the comings and goings of all the people who use the space.

Lunch at RuraliS. The SME was founded in 2016 with the aim of offering high-quality products from a selection of small organic farms using natural, low-impact production methods and paying particular attention to protecting biodiversity and animal welfare. Seasonal vegetables and fruits, meats, cheeses, cured meats, and eggs from pasture-raised animals, olive oil, baked goods, pasta, flour, legumes, and grains. Artisanal jams, sauces, and marmalades. Wines and farm beer. RuraliS uses the organic olive oil produced in the Blera cooperative mill.



## Capacity building programme

### CASE STUDIES

[Cantine Ermes \(Italy\)](#)

[CUIB – Urban Centre for Good Initiatives \(Romania\)](#)

[Bloom Büro \(Ukraine\)](#)

[Spörgelhof eG \(Germany\)](#)

[Tarilka \(Ukraine\)](#)

[Foodsharing \(Germany\)](#)

[Euro Coop \(Europe-wide\)](#)

[Hof vErde \(Germany\)](#)

[Organic Farmers \(Ukraine\)](#)

[Agriturismo Su Stai – Podere Valbella \(Italy\)](#)

[EURAF & Agroforestry \(Europe-wide\)](#)

[CRIES – Resource Center for Ethical and Solidarity Initiatives \(Romania\)](#)

[LOCALtoYOU \(Italy\)](#)

[BEE Rural.Hub & Cooperativa Miledù \(Spain and Italy\)](#)

[Farm-to-Table Partnerships \(Europe-wide\)](#)

[SUPERCOOP Bremen \(Germany\)](#)



## Partners

- Diesis Network - Coordinator
- Asociația Centrul Pentru Legislație Nonprofit (Romania)
- Associazione Generale Cooperative Italiane (Italy)
- Charitable Organization Platform for Social Change (Ukraine)
- Consorzio Ruini Società Cooperativa Consortile Impresa Sociale (Italy)
- innova eG (Germany)



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Find more on the  
Grains Project

<https://diesis-network.coop/grains/project/>