

The FOLOU project presents its **Twinning Regions Programme** 

The FOLOU project is bringing knowledge and consensus to prevent and reduce Food Loss at the primary production stage.

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REGIONAL PUBLIC AUTHORITIES FARMERS, FISHERMEN & THEIR ASSOCIATIONS RESEARCH CENTERS AND UNIVERSITIES















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# Objectives of the FOLOU project

Chapter 1









### Each year, a substantial amount of food losses (F are generated across Europe

FL have negative impacts on the society, contributing to resources depletion (water, soil, agricultural inputs, energy), environmental degradation, GHGs emissions and to the increasing severity of climate change impacts. They also represent a burden for farmers and public authorities who must manage the generated waste.



food (fresh mass) across the EU-27 lost in 2020. according to JRC.

To face this challenge, the FOLOU project aims to provide the instruments to build knowledge and consensus to quantify, prevent and reduce food losses at the primary production stage across European Member States and the different actors of the primary production sector. The FOLOU project aims to:

- **u** test and validate the measuring protocol and the estimation technologies for food losses at primary production stage, encompassing the agriculture, aquaculture, and fisheries sectors;
- **monitor and report** food losses at Member States and European levels through the prototyping of a national registry for food losses accounting;
- assess the magnitude and impact of Food Losses and identify its direct and indirect drivers.











# Project overview



#### **Consortium Partners**

**Financing line:** HORIZON-CL6-2022-FARM2FORK-01 **Duration:** 48 months (January 2023 – December 2026)

#### **5** case studies:

□ Fruits and vegetables (Spain, France & Belgium)

- Grains and pulses (Italy)
- Roots and tubers (Belgium)
- Meat and dairy (Ireland, Belgium)
- Aquaculture and Fisheries (Salmon in Norway, Mussels in Italy)













# The 5 food categories

FOLOU works on 5 key food categories, with case studies for methodological application in several European countries:













# Production systems

To assess the impact of different farming practices on the generation of food losses, and to establish the magnitude of the occurrence depending on the characteristics of each production system, the FOLOU project takes into account the distinguishing features of 3 key farming systems:

- Conventional farming
- Organic farming
- □ <u>Agro-ecological farming</u>

Key elements of the 3 production systems:

	CONVENTIONAL AGRICULTURE	ORGANIC AGRICULTURE	AGRO- ECOLOGY
Use of chemical inputs	$\checkmark$		
Use of GMOs	$\checkmark$		
Sustainable Land management		$\checkmark$	$\checkmark$
Crop rotation		$\checkmark$	$\checkmark$
People-centred approach			$\checkmark$
Social equity aspects			$\checkmark$









**Conventional agriculture** is a farming method that relies on high inputs of machinery, fossil fuels and synthetic chemicals, including fertilizers and pesticides. Genetically modified organisms (GMOs) may also be used. Despite the term conventional, such agricultural methods have evolved only since the industrial revolution (19th century) and became widespread after the mid-20th century. It is also referred to sometimes as "industrial agriculture" (IPBES).











### Organic agriculture

**Organic agriculture** is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved (IFOAM).

As a general principle, organic farming does not use synthetic chemical inputs such as fertilisers and pesticides, and prioritises crop rotation, humus management, biological plant protection and animal welfare. Organic agriculture stands for fair and responsible land management that aims to protect the health and wellbeing of present and future generations and the environment (<u>GIZ</u>).









### Agroecology

**Agroecology** is a holistic and integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of sustainable agriculture and food systems. It seeks to optimize the interactions between plants, animals, humans and the environment while also addressing the need for socially equitable food systems within which people can exercise choice over what they eat and how and where it is produced.

Agroecology is concurrently a science, a set of practices and a social movement and has evolved as a concept over recent decades to expand in scope from a focus on fields and farms to encompass the entirety of agriculture and food systems. It now represents a transdisciplinary field that includes the ecological, socio-cultural, technological, economic and political dimensions of food systems, from production to consumption.

Agroecology is based on bottom-up and territorial processes, helping to deliver contextualized solutions to local problems with people at the centre. There is no single way to apply agroecological approaches – it depends on local contexts, constraints and opportunities but there are common principles that have been articulated in the framework of the 10 Elements of Agroecology (<u>FAO</u>).











# Food loss definition

At present, in the EU terminology, there is no clear-cut definition of what "Food Loss" are, and what food system boundaries apply to it. In its Delegated Decision (EU) 2019/1597 of 3 May 2019, supplementing Directive 2008/98/EC of the European Parliament and of the Council in regard to a common methodology and minimum quality requirements for the uniform measurement of levels of food waste, the European Commission refers to "food waste in primary production". The latter excludes food that gets lost before and during harvest, which means that food at these stages is neither measured nor reported. As a result, this definition excludes food wasted at harvest and pre-harvest phases. This is better illustrated <u>here</u>.

At the international level, <u>FAO provides a definition of Food Loss</u>. This definition does not fully align with the EU definition of the boundaries with food waste. As a result - through an EU-wide consultative process - <u>the FOLOU project has developed a definition of Food loss</u> that accounts for the EU criteria to define food waste. This definition is instrumental to define what (and when) to measure. The FOLOU definition of FL avoids double counting and ensures a smooth reporting of data for the primary production stage.













### Food loss definition FAO

"Food loss is the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers (State of Food and Agriculture [SOFA], 2019). Empirically, the term refers to any food that is discarded, incinerated or otherwise disposed of along the food supply chain, which starts with harvest/slaughter/catch up to but excluding the retail level, and the food does not re-enter the supply chain for any other productive use, such as for feed or seed."

Source: SOFA, 2019

















Chapter 2

General overview

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Structure of the Twinning Regions Programme

Module 1: National Food Loss Registry

Module 2: Food Loss Drivers

Module 3: Productivity loss and food loss estimation technologies

Module 4: Food Loss Quantification Protocol

Module 5: The FOLOU Sustainability Tool

Module 6: The FOLOU Learning Centre

### About the Twinning Regions Programme

Chapter 2











# General overview

The FOLOU Twinning Regions Program (TWRP) is a **24-month program** starting in January 2025. Through the TWRP, the FOLOU partners will collaborate with actors outside the project consortium to **validate and apply** the methodology for food losses quantification, and to **test** the IT-based monitoring technologies developed by the FOLOU partners.

The program provides **technical support** to participating actors in quantifying food losses across 5 key food categories, while providing opportunities for **peerlearning** and for **knowledge sharing**.









# Target groups

The main target groups of the FOLOU TWRP are represented below. Collaboration within the groups is encouraged although not mandatory.

Group 1	Group 2	Group 3
REGIONAL PUBLIC	FISHERMEN, FARMERS	RESEARCH AND
AUTHORITIES	AND THEIR ASSOCIATIONS	KNOWLEDGE CENTERS
Public Administrations/regional authorities/regional ministries of agriculture / waste / environment	Farmers, farmers' associations, farmers' cooperatives, producers' organizations, agri-food clusters, Agri-food Living Labs, farm advisers & public extension services, public agricultural advisory services, regional chambers of agriculture	Research institutes, universities in the regions, agriculture schools (agronomy schools), Innovation Support agents, Agri-food Living Labs and Lighthouses







# Structure of the TWRP

<b>Module 1</b> National Food Loss Registry	<b>Module 3</b> Yield gap and Food Loss estimation technologies	<b>Module 4</b> Food category- specific Food Loss quantification protocol		
<b>Module 2</b> – Food Loss Drivers				
<b>Module 5</b> – Sustainability Tool				
<b>Module 6</b> – Learning Center				











### National Food Loss Registry

The National Food Loss Registry (N-FLR) is a database system being prototyped by the FOLOU project partners where data on farm-level food losses are stored, following the food loss quantification methodology developed in Module 4. This platform allows the farmer to store information on food losses generation at farm-level on a digitalized platform. Farm-level data is then aggregated at territorial scale, and public authorities can use this platform to monitor the performance of the regional farming system and can use the data for the mandatory reporting of food loss data to national authorities (Commission Delegated Decision (EU) 2019/1597).

The IT infrastructure for the N-FLR is currently being developed for the region of Catalonia (Spain) through a collaboration between the regional waste agency of Catalonia (ARC), the regional department for climate action of Catalonia (DARPA) and the University of VIC. The platform will be tested with farmers in Catalonia. With the establishment of a European Food Loss Registry (E-FLR), the FOLOU project aims to use the N-FLR as a building block of the E-FLR, potentially anticipating the development and adoption of a mandatory food loss reporting scheme at EU-level.











### National Food Loss Registry

#### BENEFITS

Public authorities in the Twinning Regions interested in the features of the N-FLR are invited to test the IT tool in their territories, providing feedback on its performance, and contributing to the improvement of the tool for potential adoption.

Knowledge and research centers are also invited to test the platform and provide contributions to its improvement. Fishermen and farmers can provide their feedback on the platform's ease of use, while gaining insights on the amount of FL their business is generating.









### Food Loss Drivers

This module allows users to validate FOLOU's preliminary findings on the direct and indirect drivers of food losses in agricultural production. These drivers have been categorized into 3 groups: behavioral, societal and environmental. Participants will be able to access the list of drivers and rank them according to their level of importance. They will also be able to contribute additional insights into the role of each driver and how to potentially address them.

<b>Behavioral drivers</b>	Societal drivers	<b>Environmental drivers</b>
= Crop management at field level, farmers and fishermen knowledge, skills, and abilities, etc.	= Food appearance, retail sector marketing standards, market price of the product, etc.	= Hail, droughts, excessive rainfall, excessive temperatures, pests, etc.









### Food Loss Drivers

#### **BENEFITS**

For **public authorities**, the results of module 2 provide insights on elements to be addressed in territorial, regional and national policies aiming at food loss prevention and reduction in the primary sector.

For **farmers and fishermen**, the module helps them better understand the reasons behind food loss in their specific business and operational context, whether other actors face similar challenges, the extent of these challenges, and what corrective strategies are being adopted.

For **knowledge centers** this module enables further investigation into the relative weight of the identified drivers the specific context of their territory, and the drivers specific to the food category most cultivated / harvested in their region. Universities and research centers will have a tool to gain deeper insights into context-specific drivers of food loss, allowing them to develop targeted actions to reduce and prevent its occurrence.









# Productivity loss and food loss estimation technologies

Module 3 gives Twinning regions the opportunity to participate in testing the IT technologies deployed in the FOLOU's project pilots for estimating yield losses during the pre-harvest phase (also referred to as <u>production losses</u>) and <u>food losses</u> during the harvest and postharvest phases. These technologies are currently being tested on the following food categories: fruits (apples, peaches), vegetables (lettuce, cauliflowers), cereals (wheat), oil seeds (sunflower), pulses (fava bean) and fisheries (trout, mussels).

The extent to which these technologies can be tested in the TWR will depend on the availability of IT supporting tools, instruments and datasets in the participating regions. If lab or field testing in the TWR is not feasible, farmers and farmers' associations will be invited to participate in demonstration sessions at FOLOU's pilot sites.

### FOL

#### **BENEFITS**

Farmers, fishermen and research centers can assess the validity of the IT-tools developed by the FOLOU project and evaluate the pros and cons of their potential future use. This process can facilitate earlier adoption if the technology proves to be suitable for the user's needs and can accelerate the digitalization of the EU farming system (including fisheries).







Level	Technology	Used for	Applied to
Food loss in agriculture	Embedded video cameras and drones (UAV) using Al technology	Directly measuring food loss on vegetables by detecting damage in the crop	(FR) Above-ground growing vegetables (cauliflowers, lettuce)
	High resolution RGB imagery with drones (UAV) and AI	Detection of damage on fruit to estimate directly the food loss	(BE) Fruit orchards (apple, mandarin)
Production loss in agriculture	Time series of multispectral UAV and satellite data. Crop growth modelling	Deriving info on crop status and crop stress level. Estimating crop yield and crop yield loss	(BE) Potatoes (IT) Sunflower, wheat, maize
Production loss in aquaculture	Use of multi-spectral cameras (VIS + NIR) & Al	Automated counting of fertilized and non-fertilized fish eggs. Selection and separation of non-fertilized eggs in hatching systems	(IT) Salmonids (rainbow trout)
Production & Food losses in aquaculture	Blockchain and distributed ledger technology	Measuring and tracking production and food loss across the production chain. Securing data on food losses. Accounting of cold chain monitoring	(IT) Mussels
Predicting consumer demand from social media for FL prevention in agriculture (indirect method)	Market demand tool based on data from social networks.	Analysis of social media data to predict food consumption, demands and production (incl. losses)	(SP) Diverse (Grains, Fruits, Root Tubers, Meat, Fish)







# Definition of production losses

**Production losses / crop yield losses** (also known as crop yield gap): this is the difference between the optimal crop yield and the actual crop yield. Production losses can result from several different causes, e.g. water stress, excessive heat, fungal infections, hail, frost, etc. Causes are generally related to the environmental conditions where the crop is grown. Production losses occur BEFORE harvesting.











# Definition of food losses

**Food losses**: any harvest-mature plant, animal or living being (including inedible parts) that is not successfully harvested, as well as food removed from the supply chain during post-harvest phase that does not become animal feed, by-product or food waste. As a result, food losses can occur:

- BEFORE harvesting: mature vegetables or fruits left on the ground/on the trees as a result of farmers' decisions not to harvest
- DURING harvesting: i.e. fish discarded during hatching;
- AFTER harvesting: fruits getting spoiled and discarded when collected on the farm













### Food losses quantification protocol

Through Module 4, farmers in the Twinning Region will be able to test the methodology for quantifying food losses at the plot level and extrapolate these figures to estimate food losses at farm level. Similarly, fishermen will be able to apply the same procedures to quantify losses in aquaculture.

The FOLOU methodology for collecting food losses data is referred to as the food losses measurement protocol. This protocol provides guidelines on how to extrapolate farm-level data to broader territorial and regional levels. It is food commodity-specific, with tailored methodologies developed for the food categories of fruits, vegetables, cereals, seeds and oil crops, pulses, meat and dairy and the fish sector (freshwater (trout) and sea aquaculture (mussels and salmon).









### Food Loss Quantification Protocol

#### BENEFITS

The food losses quantification methodology developed by FOLOU aims to generate empirical knowledge on food losses by collecting data at various points during the harvesting season. Collaboration in this module allows participating actors to compare their performance with participants in other Twinning Regions cultivating the same crop. This opens doors for new collaboration opportunities to improve agricultural performance at both the farm and regional levels with other actors in the same sector.

Data collected at farm level through Module 4 will serve as input to Module 1 (The National Food Loss Registry) where data is aggregated at regional and national levels.

Engagement of Twinning Regions through Module 1 and Module 4 will provide regional authorities with more empirical data to assess the scale of food losses generated at the territorial level, their fluctuations over time, and their impact on climate change. Impact assessment and related corrective measures are addressed in Module 5 – Sustainability tool.









### The FOLOU Sustainability Tool

Module 5 provides the opportunity to evaluate the magnitude and impact of food losses based on environmental, economic and social criteria using the FOLOU Sustainability Assessment Tool. Using collected data, the module elaborates a Life Cycle Assessment (LCA) where the contribution of food losses to greenhouse gas (GHG) emissions is calculated. The analysis also includes an assessment of the impact on habitat degradation and biodiversity loss.

The Sustainability Assessment Tool combines data from the National Food Loss Registry (Module 1), with LCA inputs to assess the sustainability of current production models in the region. It also evaluates the impact of adopting mitigation strategies for the reduction of food losses, quantifying the resulting benefits in economic, environmental and social terms.

#### BENEFITS

The FOLOU Sustainability Tool is designed for technicians from public administrations and researchers from knowledge centers responsible for the assessment of the environmental impact of agricultural and fisheries practices, including the potential positive impact of food loss reduction strategies.











### The FOLOU Learning Centre



The FOLOU project aims to build broader EU-wide capacity for understanding and managing food losses, partly through offering **qualified learning courses** to actors in the primary production sector. To achieve this, the FOLOU Learning Centre is developing a range of courses and learning materials designed to build skills and knowledge on food losses that will benefit a variety of users.

Activities are organized around **5 key learning areas** with materials including interactive online courses, training manuals, YouTube videos and demonstrations, 'how-to' guides and briefing notes.











**Introduction** to food losses in primary production (Q1, 2025): Provide a general introduction to the importance of measuring and reducing food losses

**Measuring food losses**: implementing the FOLOU methodology (Q4, 2025): Present the framework, methods and tools available to develop a food loss inventory, along with a repository and reporting processes

**Technological innovations** in food loss measurement and estimation (Q2, 2026): Outline current and innovative technologies and their potential application in food loss reduction

**Food loss sustainability implications** (Q4, 2026): Instil greater understanding of the need to measure, evaluate and minimise food loss through the use of the FOLOU sustainability tool

**Integrating food loss** into policy and decision making (Q3, 2026): Support the integration of food loss considerations into policy and decision-making















#### BENEFITS

All 3 key stakeholder groups are encouraged to use these materials to explore opportunities to reduce food loss across the different production systems.













Chapter 3

Timeline of the programme

Modularity (flexibility)

Mutual cooperation principle

Three formal requirements to participate

### Practicalities

Chapter 3



Project objectives









# Timeline of the programme











### Modularity (flexibility)

The FOLOU Twinning Regions and actors will be able to tailor their participation to the program according to their needs and interests, selecting one or multiple modules that the entities will commit to collaborate on. Depending on the profile of each participant, some modules will be more relevant than others (see figure below).

	Module 1 <b>N-FLR</b>	Module 2 <b>Drivers</b>	Module 3 <b>Technologies</b>	Module 4 <b>Methodology</b>	Module 5 Sustainability assessment	Module 6 Learning Centre
Regional Public Authorities	$\sqrt{}$	$\checkmark$		$\sqrt{}$	$\sqrt{}$	$\checkmark$
Farmers and Farmers Associations	$\checkmark$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\checkmark$	$\checkmark$
Research & Knowledge Centres	$\checkmark$	$\sqrt{}$	$\sqrt{}$	$\checkmark$	$\sqrt{}$	$\checkmark$









### Modularity (flexibility)

While participation to the program is open to <u>the 3 categories of stakeholders</u> presented earlier, the FOLOU partners encourage interested parties to adopt a multi-stakeholder engagement approach where representatives from all 3 categories collaborate in the implementation of the program. This level of engagement will deliver the highest results in terms of understanding, management and impact.

Overall, participating regions will be selected to ensure a homogenous representation in terms of crop categories, production systems and geographical distribution across Europe.











### Mutual cooperation principle



The FOLOU TWRP is a COLLABORATIVE process. This means that while the selected Twinning Regions will benefit from the support of the FOLOU project partners in the testing and adoption of the FOLOU tools, knowledge and technologies, FOLOU partners will also benefit from feedback loops from the participating regions to further refine, adapt or improve the tools being developed.



Participating regions, will not only benefit from the knowledge exchange with the FOLOU partners (sectoral experts, universities and technology partners), but they will also have the opportunity to exchange information and practices with other European regions, building cooperative knowledge to address food loss reduction and prevention.



Project objectives









### Formal requirements

There are three formal requirements to participate to the programme Designate a **referent authority** for the participating region (or participating actors within the region when the main beneficiary is not a regional authority)

Sign a **Letter of Agreement**, and commitment to collaborate in the program

Draft a short **final report** to summarise the outcomes of the participation in the program











Chapter 4

Why would your region join the Twinning Region Programme?

Benefit 1: Testing and early adoption of innovative technologies in agriculture

Benefit 2: Support the digitalisation process of the farming system

Benefit 3: Anticipate future policy developments and legislation requirements

Benefit 4: Knowledge Sharing and Networking

Benefit 5: Increase farm-level resources use efficiency and improve farm revenue

How to join the FOLOU Twinning Regions Programme?

### Reasons to join the TWRP

Chapter 4











Why would your region join the Twinning Region Programme?





The TWRP seeks to **enhance human and technical capacity** of farmers, research centres and public administrations to estimate, measure, report and act upon the drivers of food losses in the primary production sector.



Through the participation to the program, FOLOU Twinning Regions will have the opportunity to **strengthen their multiactor, participative and holistic approach** to address the food loss challenges.



Participants to the program will have the opportunity to **learn from the experience of the FOLOU pilot regions** by taking part in the 7 national stakeholders' workshops organised in 2026.



Project objectives









# Overall, regional authorities and food sector stakeholders will be able to benefit from:



adoption of **innovative technologies** in agriculture Benefit 2: Support in the **digitalisation process** of European agriculture

#### Benefit 3:

Anticipate future **policy developments** and legislative requirements

#### <u>Benefit 4</u>

Knowledge sharing and networking

Benefit 5: Increase resources use efficiency and farm revenue









#### **Testing and early adoption of innovative technologies in agriculture** *Benefit 1*

Participants of the FOLOU TWRP will have the possibility to test and validate the relevance of ITbased technologies (i.e. Deep Learning Algorithms, Remote Sensing, Artificial Intelligence, Blockchain) tested in the FOLOU's pilot countries, and to promote their adoption among regional actors interested in the technologies.

The cutting-edge technologies make use of tools such as embedded tractor cameras and drones, and are tailored for application based on cropspecific characteristics, and the fisheries and aquaculture prevalent practices.













#### Support the digitalisation process of the farming system Benefit 2

Testing an earlier adoption of the national food loss registry will help participating regions align with <u>the EU digital</u> <u>transition policy</u> which also includes a stronger digitalization of the farming sector.













#### Anticipate future policy developments and legislation requirements Benefit 3

Helping public entities and the agricultural (incl. fisheries) actors to develop suitable tools to detect hidden sources of GHG emissions and resources use wastage. Facilitate data reporting to EU institutions in accordance with the requirements of the revised Waste Framework Directive.







Project objectives

<u>Practicalities</u>

Reasons to join







#### Knowledge Sharing and Networking Benefit 4

FOLOU Twinning Regions and their knowledge centres will join a network of EU entities who are already working on the testing and development of the technologies, and on the assessment of sustainability indicators via Life Cycle Assessment (LCA) and Environmental Footprint Analysis.

They will benefit from mutual knowledge sharing and have the possibility to exchange best practices, experiences, and solutions with other organisations working on similar challenges.











#### Increase farm-level resources use efficiency and improve farm revenue Benefit 5

By reducing food (crops and fish) losses, producers can increase production without further exploiting resources and inputs. They can increase revenues while reducing costs associated with waste management













### CURRENT LEGISLATIVE LANDSCAPE ON FOOD LOSS QUANTIFICATION

#### Food losses as a mandatory reporting element of the Waste Framework Directive

The revised Waste Framework Directive adopted in May 2018 set an obligation for European Union (EU) Member States (MSs) to prepare food waste prevention programs, identifying action to prioritize intervention actions according to the waste framework hierarchy.

Since May 2020, each EU MS is required to report data of food waste generation per each stage of the food value chain, on an annual basis. This includes the primary production level. The requirement comes from the adoption of the Commission Delegated Decision EU 2019/1587 establishing a common EU methodology to measure food waste. The methodology was published in the Official Journal of the European Union on 27 September 2019 and entered into force on 17 October 2019. The results of the first monitoring exercise became available in July 2022 through Eurostat.

Following the revision of the Waste Framework Directive in 2018, in 2023 the European Commission proposed to set binding targets of food waste reduction by 2030. While the proposed targets address food waste reduction for the processing to manufacturing (-10%) and the Horeca and household level (-30%), no target has been proposed for the primary sector. As of July 2024, the proposition was still under discussion among the EU institutions.













### CAP STRATEGIC PLANS 2023-2027 IMPLEMENTATION

#### Implementation of the Common Agriculture Policy across European Member States

The revised Common Agriculture Policy (CAP) of the European Union aims to foster a smart, competitive, resilient and diversified agricultural sector in Europe, ensuring longterm food security, and strengthening the socio-economic context of rural areas. The CAP also aims to align the farming sector with the EU commitments on climate action, fostering the development of agricultural production systems that are not in contraposition with biodiversity and environment protection action. Each Member State of the EU has developed a CAP Strategic Plan for the period 2023-2027.

Investing in technological innovation that support farmers in reducing yield and food losses in agricultural production has direct positive effects on 6 (of the 9) key policy objectives of the new CAP, namely:

- Supporting viable farm income
- □ Increase farm competitiveness
- Contributing to Climate Change mitigation
- Efficient natural resources management
- Responding to societal demands on food and health (incl. reduction of food waste)
- Fostering knowledge and innovation (incl. digitalization)

At present, food loss monitoring and reduction is not a widespread priority action in national CAP Strategic Plans, but it could become a target action of the upcoming legislation.









### DIGITALIZATION PROCESS OF THE EUROPEAN FARMING SECTOR

#### Digitalization of the European farming sector

The European Union is promoting a EU-wide adoption of AKIS, the Agricultural Knowledge and Innovation System that supports EU member states and EU farmers achieve a green and digital transition of the agriculture sector. Developing a solid and informative AKIS requires investments in data collection, validation and analysis processes, which then feed knowledge for the development and adoption of innovations that support the competitiveness of the European agricultural sector. As a result, one of the aims of AKIS is to improve the performance of EU farms through an enhanced knowledge sharing and an understanding of farm-level performance on set indicators. AKIS equally aims to facilitate knowledge exchange on good practices among European farmers, moving beyond regional and national borders, and establishing collaborative initiatives on specific themes or operational areas.

The push for investment in the digitalizing the European agricultural sector are a result of the process of digital transformation resulting from the 2030 Europe's Digital Decade targets. These targets aim to empower European businesses and people in a human-centred, sustainable and more prosperous digital future, targeting the development of a secure and sustainable digital infrastructure for both businesses and public services.











#### GREEN HOUSE GASES EMISSION REDUCTION TARGETS AND THEIR LINK WITH FOOD LOSSES

**The 2018 Effort Sharing Regulation** (amended in 2023) establishes for each EU Member State (MS) a national target for the reduction of greenhouse gas (GHG) emission from 10 to 50% compared to 2005 levels to be reached by 2030 in 5 key sectors – including agriculture. The effort to be made by MSs is determined by their Gross Domestic Product (GDP), with higher income MSs taking on more ambitious targets than lower income MSs with an adjustment to reflect cost-effectiveness. The Commission evaluates and reports annually on progress towards achieving the targets. If any Member State is not on track, they will be required to submit to the Commission an appropriate action plan.

Food loss prevention and climate change mitigation are closely interconnected, as reducing food waste across the entire food value chain (hence including food losses) directly contributes to lower GHG emissions. When food is wasted, all the resources used in its production, processing, transportation, and storage—such as water, energy, and materials—are also wasted. Consequently, food loss prevention not only conserves valuable resources but also plays a crucial role in mitigating climate change, helping to achieve broader environmental sustainability goals for regional and national governments.











### Implications for:

 Regional public authorities responsible for planning and managing of the agricultural sector

#### University and research centers engaged in the agricultural sector

As **Member States** are required to report annually the data on **food waste** across the entire food value chain, the food waste data at **farm/field level** shall be measured and reported by primary producers (farmers, fishermen) to **public authorities**. The mandatory reporting calls for more **accurate data** to be collected at national and sub-national level, transitioning from an estimate-based reporting system to a more representative reporting based on **sampling data**. For the coming period, it is expected that this reporting process will include in the food waste accounting also the components of food losses that are currently not part of the mandatory measurement (harvest and pre-harvest phase).

At the same time, as a result of the mandatory waste reporting and of the **digitalization** of the **EU farming sector**, the burden on data collection and storage for public authorities will significantly increase in the future. FOLOU offers the **tools** to prepare public authorities concerned with the monitoring of waste and agricultural sector data to get ready for the **green** and **digital transition**.











*Figure 1 EU territories with S3 in agriculture, fishing and aquaculture (source)* 

Participation of public authorities in the FOLOU TWRP also entails developing and testing **instruments** that can facilitate leaner management process of the agricultural sector as part of the **Common Agriculture Policy (CAP) Strategic Plans implementation** for the period 2023-2027, and as part of the **Effort Sharing Regulation** setting the targets for reduction in GHG emissions.

Given the diffuse prevalence of agricultural systems as a pillar of European economies, several European regions have chosen **Smart Specialization Strategies** (S3) that have agricultural products as their main objective. Engagement in the activities of the FOLOU Twinning Regions Programme empowers participating regions across the EU to assess the relevance of the different tools offered by the project to support higher competitiveness of their S3.

Moreover, **universities and knowledge centres** that are supporting regional actors in achieving the defined 3S can benefit from exposure to the current state of play of initiative led by other research institutes active in the same field of expertise. This EU-level interaction among institutions sharing similar objectives has the potential to create **new institutional collaborations** strengthening actors capacity to produce tangible impact on the ground.











### How to join the FOLOU Twinning Regions Programme?



To participate in the FOLOU Twinning Regions Program, you can express your interest by filling in the <u>dedicated</u> <u>application form</u>.



More information on the FOLOU project activities can be found in the project website: <u>www.folou.eu</u>

Once your interest to participate in the program will be received, you will be contacted by the FOLOU partners to discuss in more detail your priorities and interests for participation in the TWRP.



If you wish to know more about the current developments of the FOLOU project, <u>subscribe to FOLOU's newsletter</u>.







### The FOLOU partnership



October 2024