

LIFE GLEANSMART: New Sustainable Circular System for reducing food loss via Fruit Gleaning and Upcycling

Location: Spain

Budget: 2,007,636.72€

Duration: 42 months – 01/07/2023/ to 31/12/2026.

Partners: AINIA; AGROSINGULARITY; VISUALNACERT; ODYSSEY ROBOTICS; AVA-ASAJA

Project: 101113991

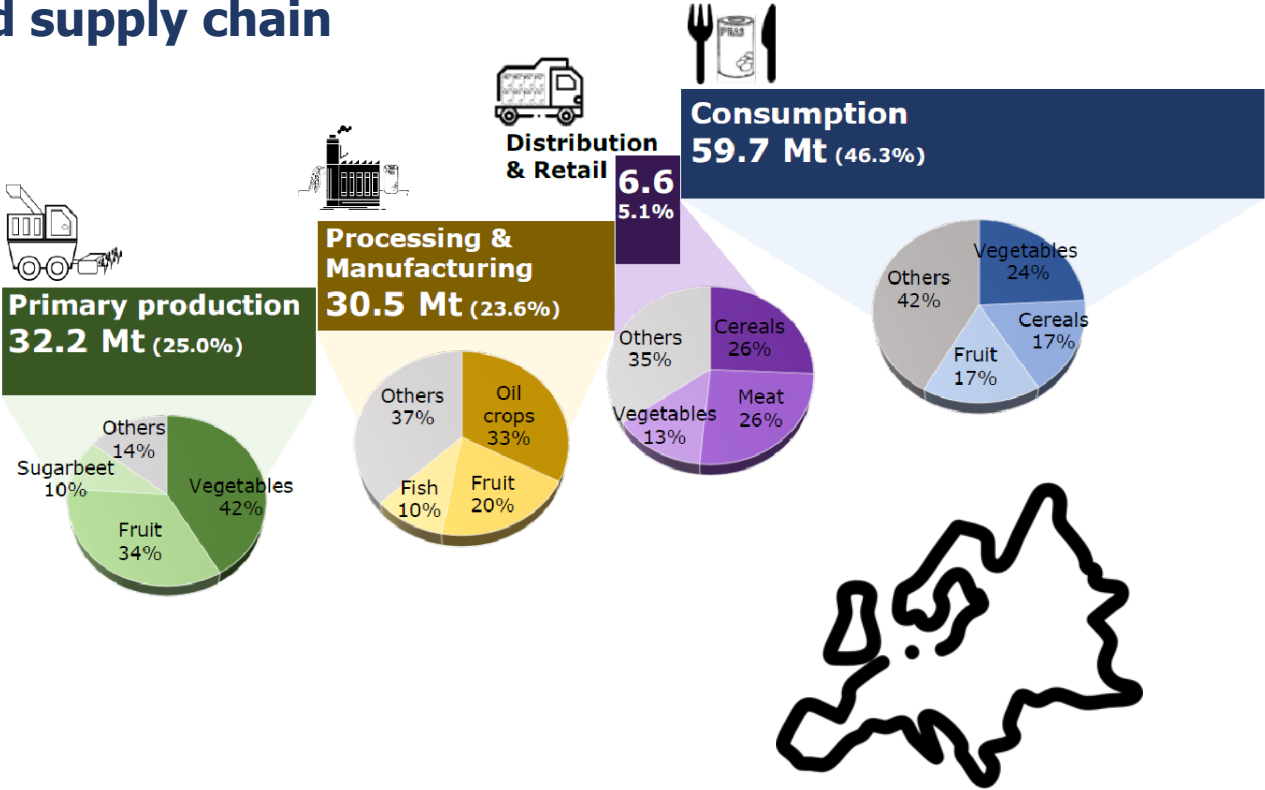


MOTIVATION



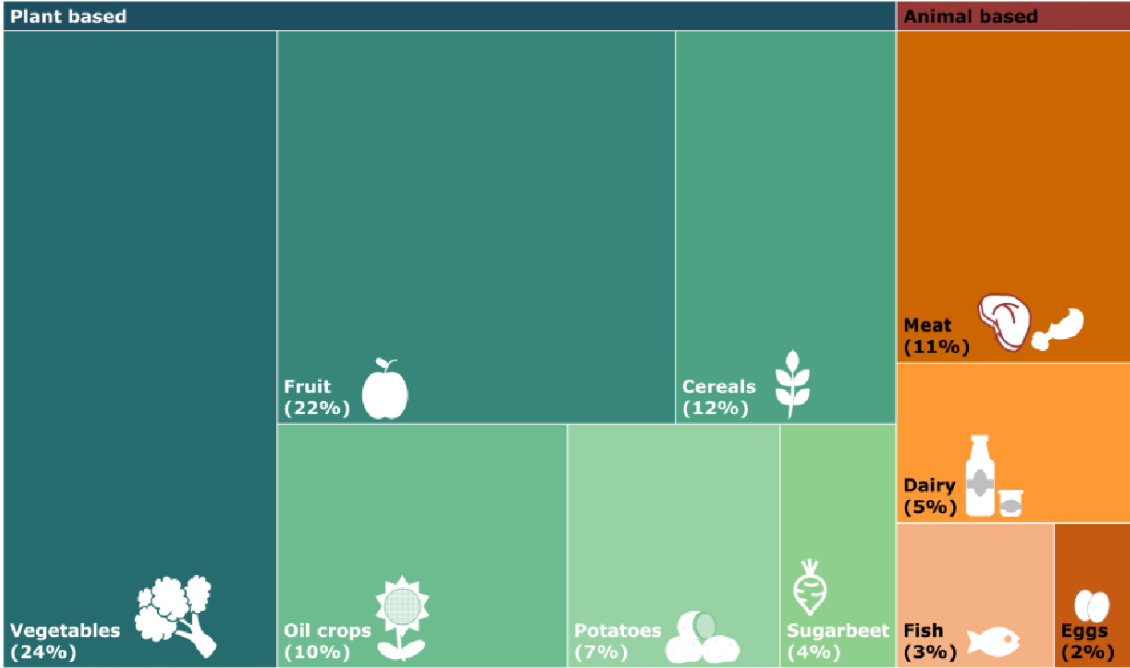
MOTIVATION

Food waste during food supply chain



MOTIVATION

Food waste
in the EU
129 Mt



ABSTRACT

LIFE GLEANSMART will reshape the paradigm of fruit food losses by proving a tested methodology to strategically plan new harvesting and gleaning procedures to improve the farmers competitiveness and to decrease the food losses by their upcycling, introducing those non-harvested fruits into a new circular value chain. In Europe, a total of 28.4 Mt per year of fresh fruit is lost or waste, representing 22% of the overall EU food waste. Fruit losses occurs in along the whole value chain but a remarkable 23% (6.5 Mt) is lost in the primary production stage, during cultivation and harvesting. However, an accurate quantification of these losing coupled with their intrinsic reasoning is missing to develop suitable strategies for reducing them. By saving 6.5 Mt of we would also be saving 2.3 Mt CO₂-eq related emissions equal to GHGs emitted by 343,238 EU citizens.

The goal is to develop a new circular value chain based on the accurate food losses quantification for planning the recovery of at least 25% of the currently fruit losses at the primary stage and its transformation it into 6 added-value upcycled powdered food ingredients validated in 3 food products. LIFE GLEANSMART will be developed by an interdisciplinary consortium of 5 partners during 3 years with a budget of 2 M€. LIFE GLEANSMART project will validate a methodology for upcycling food losses based on data-driven decision supported decisions, innovative autonomous robotics system (up to TRL-7) and a digital support platform to help farmers to strategize harvesting and reduce fruit losses. Robotic solutions will be validated in 3 real fruit orchards located in Spain for 3 types of fruits (pomes, citrus, and stone fruits) covering the most representative EU crop types. LIFE GLEANSMART contributes to the achievement of the new Action Plan for the Circular Economy, the Farm to Fork Strategy at the heart of the EU Green Deal, and the EU's commitment to achieve the Sustainable Development Goal (12.3) target on food waste

OBJECTIVES AND SCOPE

General Objective

To develop, test and validate an innovative circular methodology that enables fruit farmers to quantify, trace, and define data-driven supported decisions for recovering the currently unharvested or lost fruit through both, digitally automated and traditional techniques for gleaning and ultimately deliver high added-value products manufactured with powder from the recovered fruit.

Objective 1 - To demonstrate the feasibility of an innovative circular value chain based on gleaning for upcycling fruit that is usually lost or wasted.

Objective 2 - To develop and validate a holistic platform to support sustainable fruit “savings” based on an advanced data-driven Decision Support Tool (DST) fed by multi source data coming from satellite data, sensors, drones and robots.

Objective 3 - To solve the currently statistical gap in the fruit sector both in Spain and the rest of EU in terms of quantifying field fruit losses and waste by a robust methodology and advanced tools.

OBJECTIVES AND SCOPE

Objective 4 - To define a suitable methodology for defining a sustainable and profitable gleaning strategy based either on robotic technologies or on manual harvesting and selection of uncollected fruit.

Objective 5 - To enhance capacities of EU fruit producers and public actors to prevent more than 25% food waste and losses at the primary production stage of the fruit value chain.

Objective 6 - To demonstrate the feasibility of processing and reusing saved fruit into 6 powdered upcycled ingredients for at least 3 food products or other added-value products.

Objective 7 - To improve the sustainability of the EU fruit value chain by an innovative circular economy systemic solution contributing to its resource efficiency and green transformation.

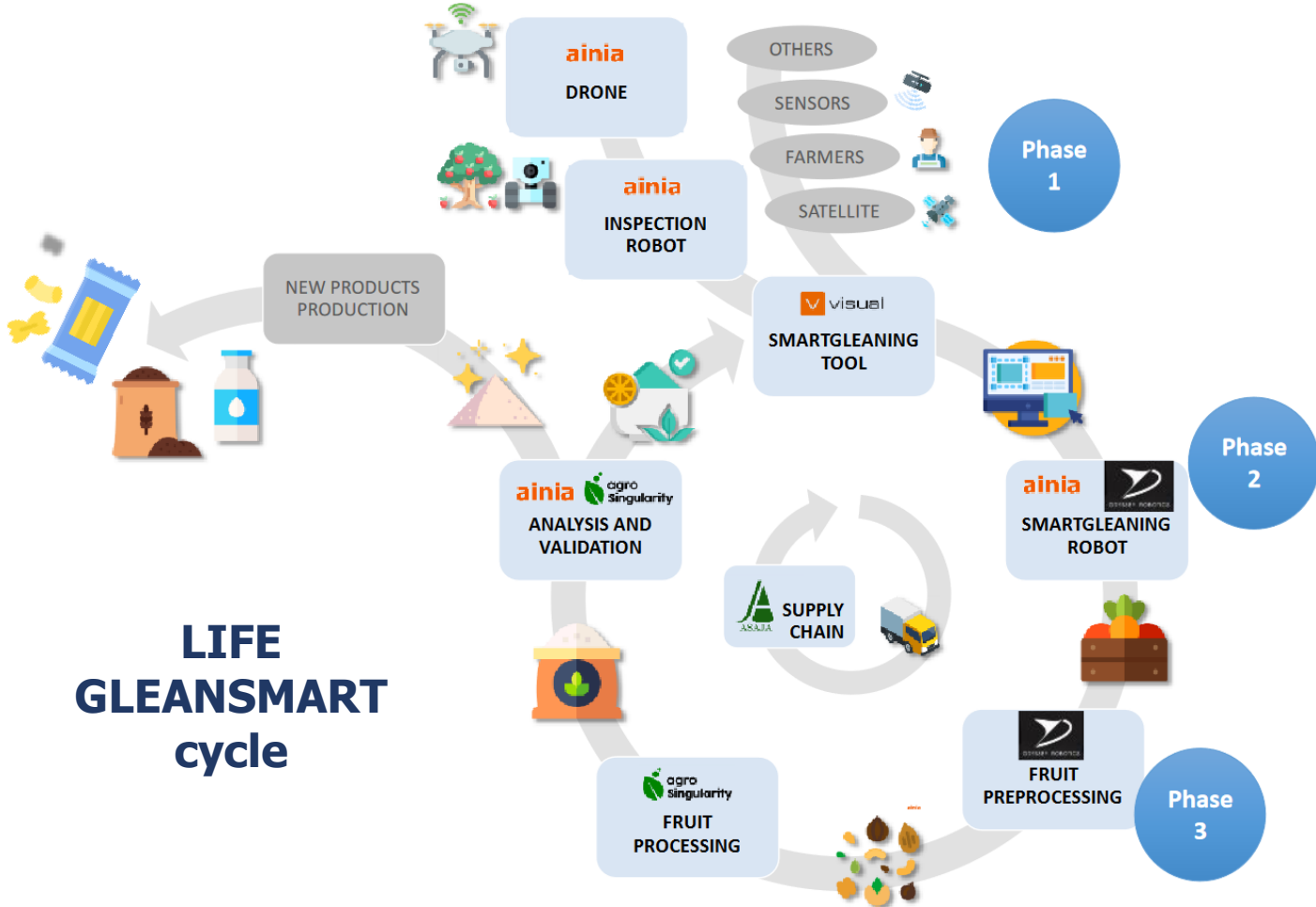
OBJECTIVES AND SCOPE

Objective 8 - To demonstrate the commercial viability of equipment and support services, to trigger investment for the long-term growth of the project.

Objective 9 - To ensure project results will be replicated beyond its geographical and thematic scope.

Objective 10 - To ensure a wide adoption of the GLEANSMART methodology at EU level and the longstanding uptake of the project results by engaging and cooperating with private stakeholders as well as public entities and advocate for a gleaning-friendly regulation at EU level.

PROJECT OVERVIEW



EXPECTED IMPACTS

TECHNOLOGICAL IMPACT

- Autonomous land robot
- DSS Gleansmart Tool
- Novel fruit processing technique
- New upcycled powdered fruit ingredients

ENVIRONMENTAL IMPACT

- Expected to collect 12t of fallen fruit
- -25% food losses
- 2/3 of harvested fruit with good quality
- 1/3 of harvested fruit upcycled
- 4.32 tCO₂-eq avoided (0.36 tCO₂-eq/t)
- Reduction of 1.8 Ml water withdrawals (150 l/kg fruit produced)
- 7562m² of land use avoided (0.63m²/kg)

ECONOMICAL IMPACT

- 200€/t of fruit recovered
- 6€/kg of natural ingredient recovered
- Generation of long-term innovation growth
- New data-driven approaches

SOCIAL IMPACT

- Improvement of the net profit of farms and agricultural holdings
- Generation of new market opportunities
- Recovery and transformation of discarded fruit into high added value products
- Addressing EU policy priorities & global challenges through R&I

POLICY IMPLICATIONS

Agriculture, fisheries and food - GLEANSMART is aligned with all the objectives that common agricultural policy (CAP) has GLEANSMART will help this area by improving the efficiency of the fields. With the aim of this project, the non-recollected fruit won't be wasted and will produce new ingredients and new products.

Animal feed - GLEANSMART brings a new source of feed without prejudice in the corresponding specific legislation (EC Regulation 1831/2003 (22/09)).

Environment - GLEANSMART objective is to reduce greenhouse gas emissions and to achieve zero-waste in the field, help preserving biodiversity and could have a broader scope to collect fruit waste that could be used for energy purposes or organic fertilisers, as well as organic cosmetics and animal feed.

Transport, telecommunications and energy - GLEANSMART will help to the goal for the EU to become a world leader on renewable energy and help society to introduce more technology into the farms by providing a digital tool for decision making. Also, developed technology will allow farmers to monitor and manage crop conditions.

Competitiveness issues - Issues relating to the competitiveness (Competitiveness Council): Single market strategy for goods and services, Strategy for a digital single market in Europe and Scientific and technological foundations.

Employment, social policy, health and medical care - Regarding the creation of employment and taking into account the education and training topic, LIFE GLEANSMART will help to create new jobs.

Nature &
Biodiversity

Climate
Change

Clean
Energy

CONTINUATION OF THE PROJECT

EU Funded Projects Conection

FOODCOLLECT



FUSIONS

Refresh

REFRESH

SWEEPEAR

CROPS

Complementarity with other actions

Integration of results of the **Inception Impact Assessment on setting EU-level targets for food waste reduction** (Oct-21)

Integration of results of the initiative launched by EC on **legally binding target to reduce food waste accross the EU**

Cooperation with Spanish Ministry of Agriculture and EC to **reduce food waste at each level stage of the food supply chain**