The LAB4SUPPLY project has received funding from the European Union's PRIMA Horizon 2020 research and innovation programme.

D3.2 Synthesis on the ASP establishment in the different case of studies

Main findings, key issues, limiting factors and new opportunities identify and created.

LAB4SUPPLY project is part of the PRIMA programme supported by the European Union's Horizon 2020 research and innovation programme.

Project acronym	LAB4SUPPLY
Project title	Multi-agent Agri-food living labs for new supply chain Mediterranean systems; towards more sustainable and competitive farming addressing consumers' preferences and market changes.
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Abstract

This document presents the main results of the development of Living Labs in the value chains selected in the LAB4SUPPLY project: tomatoes and figs in Spain, chestnuts and figs in France, carob and figs in Morocco, and goats and figs in Algeria. The project partners have led the living labs in their territories following three actions. First, a context study was carried out to identify the main challenges of the value chain under study. Secondly, stakeholders were mapped and those most suitable for the living lab were invited. Finally, activities have been planned to promote discussion, training and collaboration among stakeholders, including focus groups, workshops, and training capsules. Finally, the main achievements of the living labs concerning the sustainable development objectives are summarized.

Keywords

Living lab, stakeholders, collaboration, sustainability, supply chain.

DISCLAIMER

Contents

1 Summary of Living Labs main results

LAB4SUPPLY's main objective is to empower the Mediterranean agri-food smallholders by defining, enhancing, and transferring competitive and efficient **food supply chain alternatives**. To fulfill this main objective, the project has created 8 **Agri-food Innovation Ecosystem Living Labs** involving the stakeholders of the 5 agri-food supply chain cases of study: tomato in Spain, chestnut in France, carob in Morocco, goat in Algeria, and fig in all four countries.

The partners in each country have developed Living Lab activities adapted to the reality of their value chains, and have worked together on the fig chain at the Mediterranean level. Progress, activities, and news have been published on the LAB4SUPPLY website, as can be found on the following link: https://www.lab4supply.eu/living-labs/.

1.1 Factors affecting the success of stakeholder platforms and living labs approaches

The literature review (D1.1) provided LAB4SUPPLY with a theoretical framework and a comprehensive review of stakeholder engagement and the use of Living Labs. This task showed that **Multi Stakeholder Platforms** (MSPs) are a widely used tool to drive **R&D projects**, as they do transfer technology and innovation to smallholders, while also providing them with market information and improving their market access. MSPs can redefine the smallholders' role in the value chain, giving them greater marketing capacity and bargaining power. From there, **tangible benefits** can be obtained, such as yield increasing, selling price raising, intermediaries' reduction and financial support –the literature provides enough successful case studies to convince us that the use of such collaborative platforms is appropriate for agri-food development.

However, some authors have pointed out some **limitations** that may determine the success of the platform:

- contextual factors
- unclear purposes
- conflicting expectations
- lack of resources or funding
- stakeholder involvement

To address these constraints, the project identified the **stakeholder mapping** as a crucial step: the platforms developed within LAB4SUPPLY had to be tailored to the value chain context and stakeholders' specific needs. The more thorough this mapping, the

more adequate the channels of communication and participation, and the greater the consensus around realistic goals, the more successful the Living Lab will be.

LAB4SUPPLY developed an **innovative stakeholder mapping tool** (D1.2) based on the Analytic Hierarchy Process (AHP) (**FIGURE 1**). De decision to include stakeholders was based on the evaluation of four criteria:

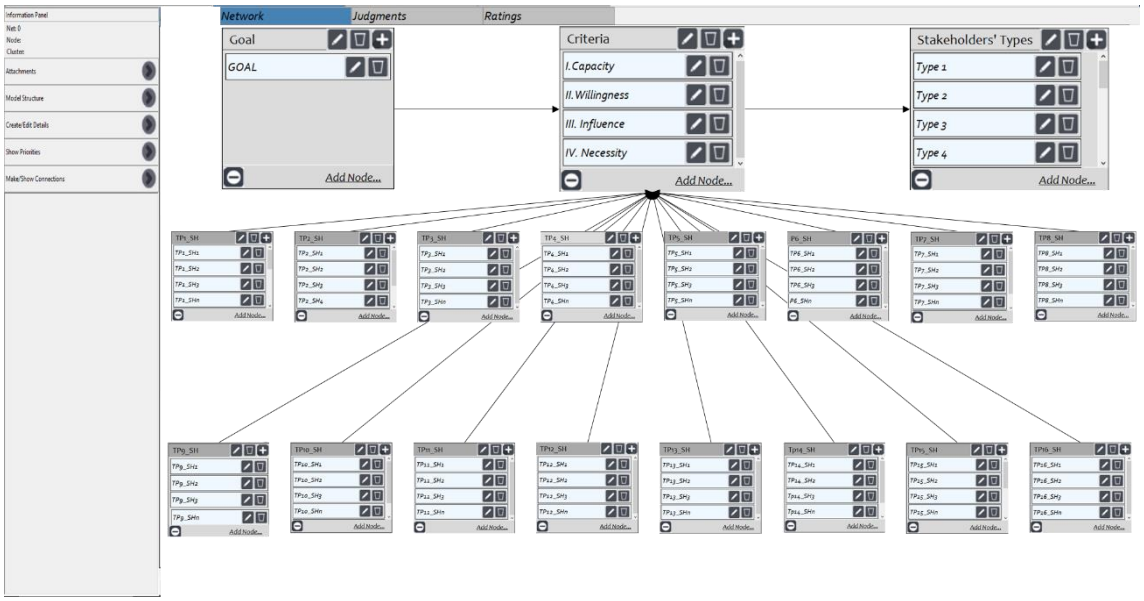
I. **Capacity**: Evaluate each stakeholder's resource capacity considering their knowledge, expertise, and technical capabilities.

II. **Willingness**: Evaluate stakeholders' availability and willingness to participate.

III. **Influence**: Evaluate the number and the quality of stakeholders' connections, which can influence all the involved parties.

IV. **Necessity**: Evaluate stakeholders' necessity for inclusion.

Figure 1. Stakeholder Mapping using AHP (Superdecision software)



To carry out the work with stakeholders, the **Living Lab** (LL) approach was chosen: physical or virtual meeting points where stakeholders form public-private-people partnerships (4P) to come up with user-centered solutions and innovations that could present a viable method to solve complex problems. The main strengths of this methodology are:

- **Real-life environment**. Where to test and validate innovations.
- **Complexity**. Address complex and dynamic social challenges and problems that often involve multiple stakeholders.

- **User engagement**. Involve end users in the innovation process, ensuring that the solutions adapt to their needs.
- **Quadruple helix**. LLs enable collaboration between different stakeholders, including researchers, industrial partners, and communities.
- **Faster innovation cycle**. Facilitate rapid iteration and prototyping.
- **Adoption Information**. Provide valuable information on the adoption and sustainability of innovations in the long term.
- **Gap between research and market**. Bridging the gap between research and market acceptance, leading to more impactful innovations.
- **Stakeholders**. Transform users into developers.

At the same time, the literature review allowed us to identify three main limitations that the Living Lab may have:

1) High cost in terms of time and expenditure.
2) Lack of evaluation of the performance and impact of the Living Labs.
3) The engagement and commitment of stakeholders.

With these limitations in mind, LAB4SUPPLY drafted and implemented a **Toolbox of methods and recommendations for stakeholder interaction** (D3.1) for the development of the living labs. The keys to success have been:

1) Efficient use of resources and stakeholders' time.
2) Monitoring of LL progress.
3) Promotion of participation through a common objective and action plan.

The development of the Living Labs followed three main steps:

1) **Context analysis**. Extensive knowledge of the topic and the context in which the platform was created, provided by expert committees or previous exploratory and diagnostic studies (Interview 1, Survey 1). The main results are collected in deliverables D1.3 (context analysis) and D3.3 (sustainability assessment by Delphi panel).
2) **Mapping**. Including the stakeholders mapping to involve key actors and engage them in the participatory process. The results are found in deliverable D1.2.
3) **Planning**. The definition of a clear action strategy through meetings (Focus Groups), workshops, and training capsules. Each Living Lab developed an Action Plan to meet its objectives.

2 Tomato value chain in Baix Llobregat (Catalonia, Spain)

The Living Lab in the tomato value chain is set in the Baix Llobregat area, in the south of the Metropolitan Area of Barcelona (Catalonia, Spain). This is the area surrounding Castelldefels, the locality where CREDA is located (Universitat Politècnica de Catalunya, Campus del Baix Llobregat), and an important agricultural hub in the south of Barcelona Metropolitan Area).

Living Lab meeting point:
Agropolis – UPC (Parc Agrari del Baix Llobregat)

Tomato Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/tomato-living-lab/

2.1 Context analysis

For the tomato Living Lab, CREDA carried out 6 interviews and 260 surveys, including 48 farmers, 105 consumers, and 107 other stakeholders (45 restaurants, 54 retailers, and 8 industries). Different stakeholders were interviewed: two producers, a wholesaler and a retailer, a representative of the local administration, and a manager of a local restaurant association.

The main results of the context analysis for the Catalan tomato value chain were:

- Farmers are opting less and less to grow tomatoes in Catalonia due to high costs and low prices.
- There is an increasing concentration of distribution through wholesalers, which is the least paid distribution channel.
- Added costs and opportunity costs discourage other alternatives such as short chains.
- Consumers mainly purchase in small and large retailers – being direct purchasing a minority option.
- Price appears to be one of the top priorities for both consumers and stakeholders, so any alternative offered must be reasonably priced if it is to be demanded.
- Direct sales appear to be the most sustainable distribution channel, particularly in terms of economic and environmental indicators.

2.1.1 SWOT analysis

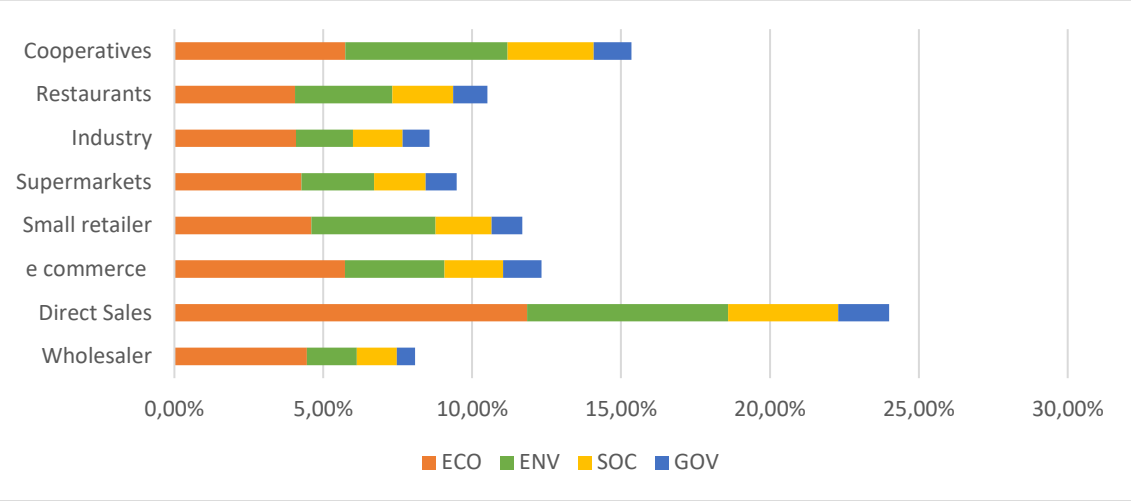
Table 1. SWOT analysis for the tomato supply chain

Weaknesses	**Strengths**
High dependency on intermediaries Lacks of transparency on price information Lack of horizontal collaboration among farmers Use of chemical fertilization Low knowledge of marketing strategies and sales High dependency on traditional sales channels. Los control of their financial situation Week economic performance High costs of production	Rejection to adopt intensive agricultural' practices Preservation of local varieties Agricultural diversification Tenure of the land (few farmers rent land) Cultivation in seasonal open-air soil Family business High knowledge of tomato cultivation process Improvement of the quality of their tomatoes
Threats	**Opportunities**
Central markets sell conditions Nor fair prices received Difficulties to cover the costs Large producers drive the market Difficulty in fixing prices Abusive or dishonest practices from large companies or intermediaries Market orientation on specific tomato varieties (high yield with low price) Market demands: low prices and availability of the product (mostly all year) Decreasing interest in tomatoes growing in Catalonian Disregard of price in central markets of varieties, precedence, and cultivation methods Strong competition based on origin (local, national, and import) Centralization of sales by wholesalers	Online sales Home delivery Consumers' interest in quality, local, and healthy products Niche market on quality products Support of local administrations Local promotion of local agricultural goods High acceptance of local varieties Regional certificates of proximity and direct sales are available Interest in adopting short food supply chains Interest in a positive impact facing environmental concerns Preference of consumers to buy tomatoes on non-traditional distribution channels Consumers' willingness to pay for tomatoes' quality and variety Consumers' preference for quality and organic labels Consumers' support for local producers and proximity products Increasing interest of restaurants to buy local products with a better price.

2.1.2 Sustainability assessment

The experts consulted in the Delphi panel attributed the most sustainability to the direct sales distribution channel, followed by cooperatives (Figure 2).

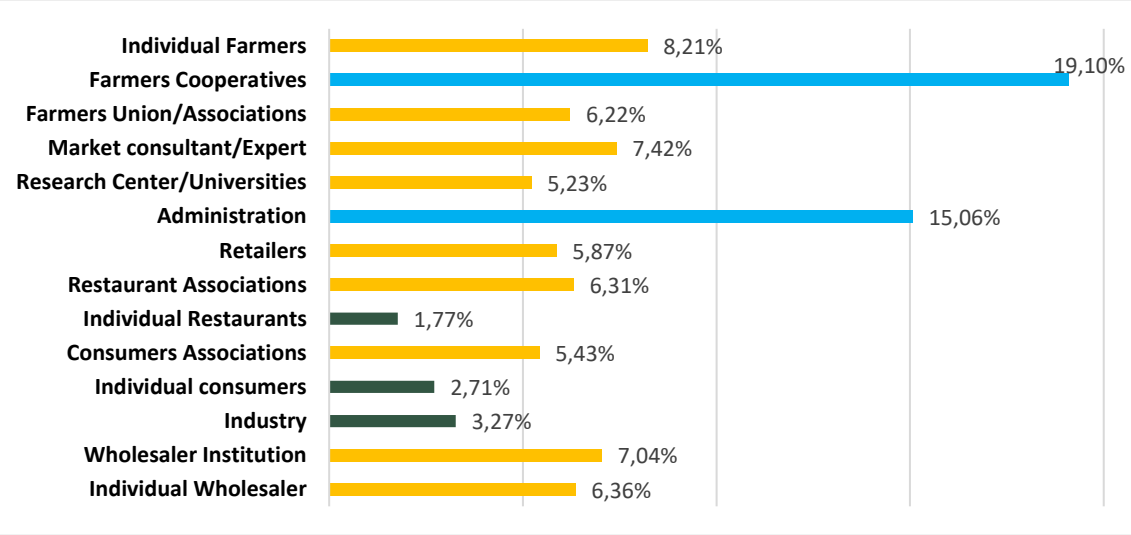
Figure 2. Sustainability of tomato distribution channels



2.2 Stakeholder mapping

According to the Stakeholder mapping, farmers cooperatives and administrations were prioritized as the most important stakeholders to be included in the Living Lab. From this point, 56 potential participants in the Spanish tomato supply chain were identified, of which 21 were finally selected.

Figure 3. Global priorities by stakeholders 'type in Spanish Tomato Supply Chain



2.3 Planning

2.3.1 Focus groups with key stakeholders

FIRST FOCUS GROUP (03/11/2022)

The first focus group was composed of the following stakeholders:

- P1 Supermarket distribution company
- P2 Wholesaler
- P3 Farmers' Cooperative
- P4 Researcher
- P5 Farmers' Union
- P6 Restaurant Association
- P7 Farmer
- P8 Farmer
- P9 Consumer Association
- P10 Farmers' Union

The initial focus group underscored the significance of delineating the responsibilities of each agent in the supply chain. Additionally, the necessity for efficient systems to ensure equitable prices for producers and increased government assistance was reaffirmed. Consumers and authorities alike concurred on the criticality of the primary sector in fostering community development.

In light of this experience, the next actions were defined (workshops and training capsules).

Figure 4. Tomato value chain first focus group

SECOND FOCUS GROUP (15/12/2023)

The second focus group deliberated on the significance and difficulties associated with tomato marketing in the region. The following stakeholders took part:

- P1 Farmer
- P2 Agricultural Cooperative
- P3 Farmer
- P4 Farmers' Cooperative
- P5 Supermarket distribution company
- P6 Consumer Association
- P7 Farmer Company
- P8 Farmers' Union
- P9 Polytechnic University of Catalonia

The session ended up with three prioritized actions:

1. Promotion and preservation of traditional tomato' varieties
2. Implementation of digitalization and promotion of cooperatives in the food supply chain
3. Improve digitalization and strengthen alliances with other stakeholders.

Figure 5. Tomato value chain second focus group

THIRD FOCUS GROUP (30/05/2024)

The third focus group took place in Castelldefels with the following participants:

- P1 Farmer
- P2 Farmer
- P3 Farmer association
- P5 Supermarket distribution company
- P6 Consumer Association
- P7 Local administration

In this session, the continuity of the Living Lab was discussed in order to continue exploring more sustainable forms of commercialization. The possibility of maintaining a common meeting place for the different actors in the chain was discussed. In addition, a commitment was made to initiate new projects with the collaboration of CREDA in order to maintain the development of the Living Lab.

Figure 6. Tomato value chain third focus group

2.3.2 Workshops

The workshops were designed with the assessment of the tomato supply chain in Catalonia in mind; nevertheless, to enhance their appeal and gain greater support from the farmers, the thematic scope was expanded. The workshops played a significant role in expanding the farmers' perspectives. Using success stories, it was feasible to provide them with insight into alternative avenues for expanding their business, primarily to increase its profitability in accordance with the sector's unique attributes.

An additional accomplishment was the integration of diverse topics: supply chain management, scientific research, and consumer engagement.

Workshop	Living Lab	Thematic
Technology and digitalisation of the horticultural sector	Tomato LL Spain	Presentation of some innovations in tomato production. Collaboration with other research projects and presentation of the main outputs and innovative contributions to the sector.
Production of traditional tomato varieties	Tomato LL Spain	Importance of preserving the biological diversity of tomato varieties and their impact on the local economy and gastronomy. Collaboration with the Bank of germplasm from the Miquel Agustí Foundation, Polytechnical University of Catalonia (UPC)
Challenges from production to consumption. Horticulture in Catalonia	Tomato LL Spain	Presentation of the challenges and opportunities of traditional vs. alternative marketing for small and medium sized producers in the primary Catalan sector.

Figure 7. Technology and digitalization of the horticultural sector (14/06/2023)

Figure 8. Production of traditional tomato varieties (17/07/2023)

Figure 9. Challenges from production to consumption. Horticulture in Catalonia (25/10/2023)

2.3.3 Training capsules:

Tomato video capsules: https://www.lab4supply.eu/tomato-video-capsules/

- Video Capsule #1: Intervention at the Horticultural Congress on Commercialization https://youtu.be/s29j6cohx7Q
- Video Capsule #2: Management and control of *tuta absoluta* in tomato crops https://youtu.be/0CgLIRmCOiY
- Video Capsule #3: Biological pest control with *Macrolophus Pigmeus* https://youtu.be/BtRq80FqFMc
- Video Capsule #4: Joan Casals (FMA/UPC) on the Germplasm Bank of Fundació Miquel Agustí https://youtu.be/bP0mbVCee88
- Video Capsule #6: The tomato sector in Almería https://youtu.be/5Pekr4cTsfk
- Video Capsule #7: Núria Carazo (UPC) – How can research improve tomato production? https://youtu.be/TdqEfghMg1Q

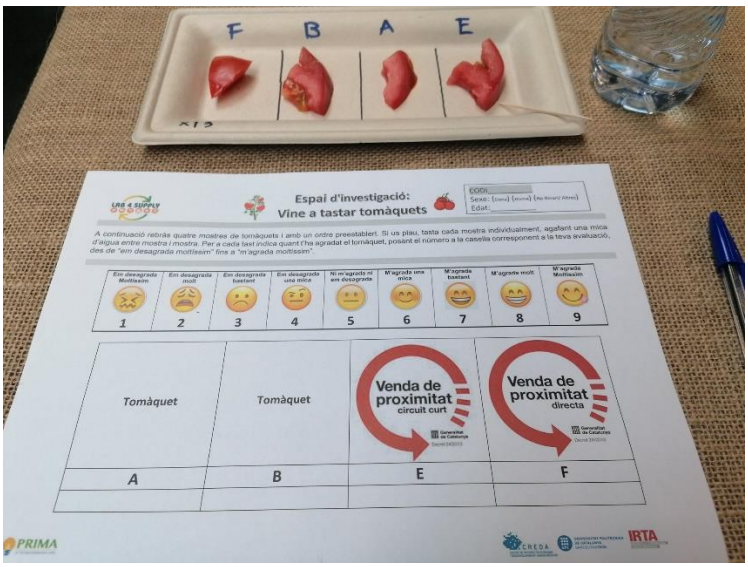
2.3.4 Other dissemination activities

During the Living Lab, other activities were carried out to raise awareness of the project among value chain actors and the general public.

Among them, the activity carried out during the "Festa del Tomàquet" in Viladecans stands out: https://www.lab4supply.eu/festa-del-tomaquet/. During this event, organized by the City Council of Viladecans and Casa Ametller, LAB4SUPPLY led the workshop “Research space: come and taste tomatoes” to investigate the impact of information about the origin of tomatoes in the perception and sensory acceptance of consumers.

Figure 10. Dissemination of the project at the Santa Susana Producers' Fair, Barcelona (08/10/2023)

Figure 11. A tasting of tomatoes with a Catalan seal of proximity (30/09/2024)



In the framework of the LAB4SUPPLY final conference (May 30th, 2024), CREDA organized the round table “Sustainability in the Tomato Value Chain. Balancing between producer benefits and consumer prices”: https://www.lab4supply.eu/final-conference/

Figure 12. Round table on the Sustainability in the Tomato Value Chain. Balancing between producer benefits and consumer prices (30/05/2024)

In July 2024, LAB4SUPPLY will participate in the second edition of the agri-food innovation event AgroTech in Viladecans. CREDA will present the conference: Conference: "Impact of direct sales and short channel certifications on consumer preferences and acceptance".

- More information on: https://agrotech.upc.edu/ca/esdeveniments/ii-jornades-dagropolis-presentacio-de-projectes-de-recerca-en-horticultura

2.4 Main outcomes

The fresh tomato sector in Catalonia is going through a **difficult time**. The main results of the context analysis point to a decline in the production of this product as production costs become more difficult to cover. The Tomato Living Lab in Baix Llobregat has focused on **distribution** to address this problem. In this way, the different stakeholders in the chain have come together to co-create solutions that allow farmers to market their product with higher margins. In this direction, dissemination and training activities have focused on providing tools and sharing knowledge about the main problems in distribution and how to adapt to consumer preferences.

One of the biggest challenges is still related to **volume**. For short distribution channels to be a viable alternative, they must be able to absorb higher production volumes. Indeed, one of the main reasons why the farmer turns to the wholesaler is to sell the entire crop, even if it means lower prices. The work with stakeholders has shown that direct sales are not a priority for producers, as they face other limiting factors related to

previous phases (production). In response, the Living Lab offered workshops and training capsules covering the entire production process, from tomato varieties to pest control.

In addition, LAB4SUPPLY carefully studied **consumer behavior** to determine the acceptability of more local and direct forms of distribution. While we found that locally sourced and short-channel purchasing met with some consumer approval, the reality is that price was still the biggest driver of the purchase decision.

In any case, the use of **certifications that include direct sale or short circuit information** was found to be a way to promote the consumption of more sustainable products by consumers. In this way, the use of certifications to indicate proximity sales is an opportunity to give added value to local tomatoes and boost their marketing to local consumers. This is a certification issued by the regional government and is part of its policy to encourage local sales and that received appreciation from stakeholders.

3 Fig value chain in Alguaire (Lleida, Catalonia, Spain)

In the case of Spain, the Mediterranean Fig Living Lab focused on the town of Alguaire (Lleida), a locality in western Catalonia that concentrates most of the fig production in this region. The choice of this location is justified by its weight in terms of production, as well as its desire to promote its "Coll de dama" fig through the Fig Fair and its attempt to obtain a PGI.

Living Lab meeting point:
Ajuntament d'Alguaire (El Segrià, Lleida)

Fig Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/platforms-fig/

3.1 Context analysis

In the case of Spain, the Mediterranean Fig Living Lab focused on the town of Alguaire (Lleida), a locality in western Catalonia that concentrates most of the fig production in this region. The choice of this location is justified by its weight in terms of production, as well as its desire to promote its "Coll de dama" fig through the Fig Fair and its attempt to obtain a PGI.

We can see how this locality is central to the Catalan fig chain:

- The growth of fig cultivation in Alguaire has been exponential in recent years.
- There is an association of local fig producers and the local administration is committed to the promotion of this product. Together, they organize the annual Alguaire Fig Fair.
- Even the hectares of figs in neighboring municipalities are mostly owned by Alguaire farmers.

However, the farmers consulted underline certain threats or points for improvement:

- There is concern about the **effect of last frosts on fig trees** (during the Fig Fair, IRTA presented research on this issue).
- **The costs of figs are mainly labor and packaging**. Figs are a delicate product and distribution boxes increase the related costs.
- **Lack of collaboration** among farmers, which is why the PGI process has slowed down. We are informed that there is one producer who concentrates most of the production, who is not willing to collaborate in joint projects.

Some actions have been put on the table, for example:

- **To obtain the Protected Geographical Indication label** for figs as a way of promoting their quality. As mentioned, the process is currently at a standstill.
- Increase **agronomic knowledge** about fig cultivation.
- To **diversify the varieties** (explore the commercialisation of "brevas" -early figs) **and processed products**.

3.1.1 SWOT analysis

Table 2. SWOT analysis for the fig supply chain (Spain)

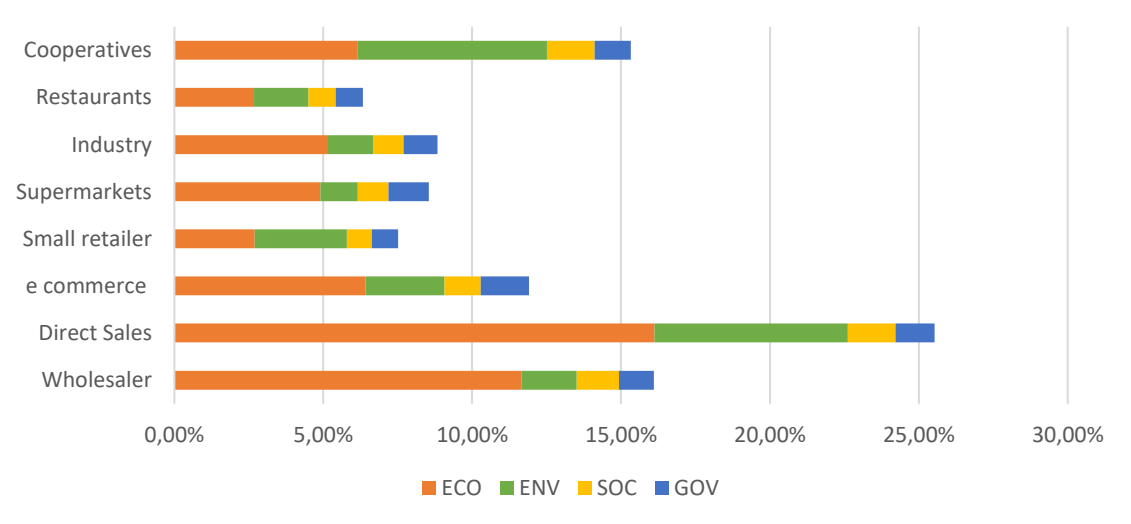
Weaknesses	**Strengths**
Sell figs as a commodity (Fresh figs) No adding value to the product High sales dependency on processing enterprises Low market diversification Lack of cost information No technification of the fig sector Significative difference in costs base on the typology of production (extensive, semi, or intensive) High cost of labour and packaging Lack of horizontal collaboration Low agronomic knowledge of fig cultivation Use of chemical fertilizers and chemical pest control Lack of interest in marketing strategies High confidence in self-financial control Low interest in environmental issues	Specialization in “Coll de dama” variety High identity of farmers with local fig Continuous growth of fig production Increasing of cultivation fig land surface High experience in the agricultural sector Use of drip irrigation Farmers’ willingness to improve their economic situation Interest in improving production quality
Threats	**Opportunities**
High dependency on small retailers Presence of abusive or dishonest market practices Regional market has low interest in fig purchasing Restaurants and food industries have low interest in fig purchasing Market predominance of imported figs	Promotion of local fig brand Celebration of Alguaire Fig Fair Interest in promoting a Protected Geographical Indication The production area is concentrated in one county Well-known reputation of Spanish fig on the export market

High loyalty to figs suppliers Preference for cheap figs	Interest of local administration to promote of fig Interest in incorporating direct sales as the main distribution channel Use of regional proximity labels Purchasing preference for small retailers Local preference for fresh fig Dry figs and fig jam's opportunity on the export market Promotion of short food supply chains Dry figs offer a high valued added Product quality is highly valued

3.1.2 Sustainability assessment

The second round of the DELPHI allowed for the adjustment of the pillar and indicator values, giving economic considerations the top priority, followed by environmental, social, and governance considerations. The experts agree that direct sales and sales through cooperatives are the most environmentally friendly marketing strategies for Spanish figs because these distribution methods have the highest levels of sustainability.

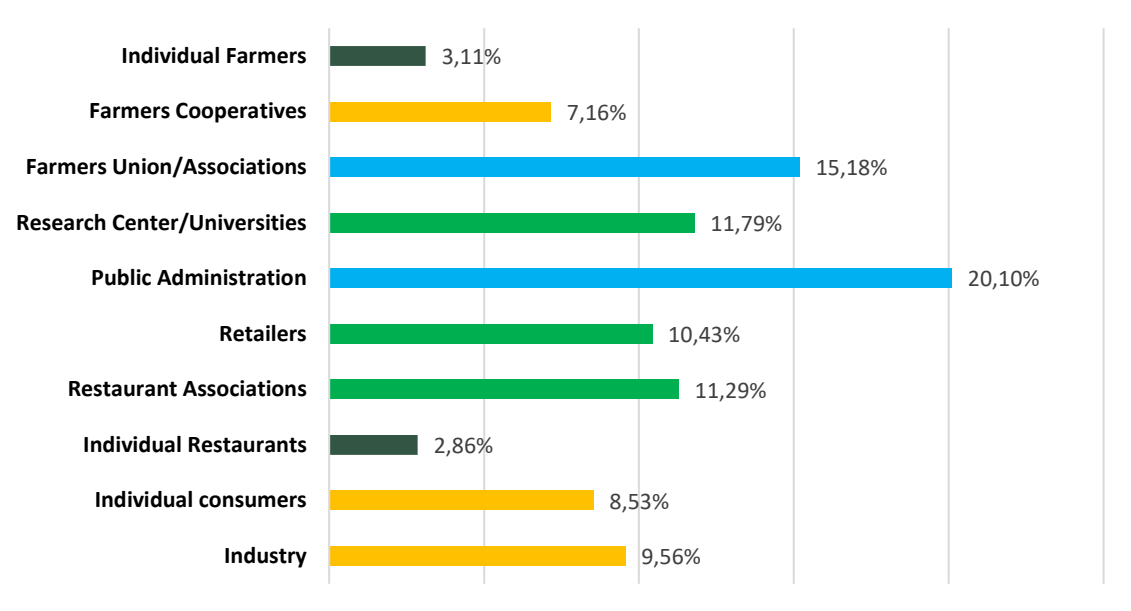
Figure 13. Sustainability of spanis fig distribution channels



3.2 Stakeholder mapping

The fig supply chain in Spain was comprised of ten stakeholder groups. The first step was to prioritize each stakeholder based on the weighted criteria, followed by assigning overall importance of each one. In this case study, two stakeholders were of high importance, three of medium importance, three of moderate importance, and two of low importance. During the identification process, 25 potential actors were defined for participation in the Living Lab, but only 13 were suitable for participation after analysis and prioritization.

Figure 14. Global priorities by stakeholders' type in Spanish fig supply chain



3.3 Planning

3.3.1 Focus groups with key stakeholders

FOCUS GROUP 1 (14/12/2022)

- P1 Farmer.
- P2 Farmer Association
- P3 Farmer Association
- P4 Farmer Cooperative
- P5 Member of City Council
- P6 Mayor of Alguaire
- P7 Regional Agricultural Department
- P8 Fig Producer
- P9 bakery Owner
- P10 Supermarket
- P11 HORECA Sector
- P12 Researcher

The first Living Lab session brought together the different stakeholders in the local fig chain to explore alternative ways of marketing figs. Two major problems were identified: high production costs and the lack of agreement between commercial partners. Possible solutions were discussed, ranging from short channels to the promotion of a private label to add value to the product.

Figure 15. Spanish fig value chain first focus group

FOCUS GROUP 2 (19/12/2023)

- P1 Farmer

- P2 Baker Owner
- P3 Researcher
- P4 Farmer
- P5 Farmer and retailer
- P6 Mayor of Alguaire
- P7 Member of City Council
- P8 Farmer and retailer
- P9 Farmer
- P10 Farmer and retailer
- P11 Farmer and retailer
- P12 Farmer cooperative

In the second discussion session, the topics discussed were taken up again and ways of putting them into practice were sought. The participation in the Fig Fair in Vézénobres was positively appreciated, as well as the twinning with the French municipality. Finally, the stakeholders welcomed the joint promotion actions with other Mediterranean producers, specifically the fig route.

Figure 16. Spanish fig value chain second focus group

FOCUS GROUP 3 (14/09/2024)

The third focus group is expected to be held in Alguaire on September 14, 2024, taking advantage of the celebration of the fig fair in the town. This is a great opportunity to bring together stakeholders and the local administration and to continue with the development of the proposed lines of action: promotion of the local brand, Mediterranean fig route, etc. The meeting should serve to discuss future forms of collaboration between the various stakeholders in the framework of the Living Lab.

3.3.2 Workshops

Workshop	Living Lab	Thematic
Fig Commercialization and Consumption	Fig LL Spain	Promotion of the importance of effective distribution channels for the sale of figs.
Fig Diversification	Fig LL Spain	Successful cases of diversification in the distribution and type of products sold based on figs (expanding the catalogue of products, in addition to fresh figs).

Figure 17. Fig Commercialization and Consumption (02/10/2023)

Figure 18. Fig Diversification (16/10/2023)

3.3.3 Training capsules:

Training capsules: https://www.lab4supply.eu/video-capsule-5-higos-el-pajarero/

Video Capsule #5: Higos el Pajarero - a case of success: https://youtu.be/xGzJz2xxp9g

Fuensanta Carrillo explains the experience with “Higos el Pajarero”: a case of success in the dried fig sector in Extremadura (Spain). The key points: the added value of the product, the adaptation to the conditions of the environment, the importance of logistics to boost the sector, and the focus on export.

3.3.4 Other dissemination activities

One of the key aspects of the Living Lab's success was to participate in industry events to explain the project and network. LAB4SUPPLY was present at the Alguaire Fig Fair. The project also organized the delegation representing Alguaire that attended the 2023 Vézénobres fig fair, where the two towns signed a twining agreement.

Figure 19. LAB4SUPPLY presentation during the fig fair in Alguaire (17/09/2022)

Figure 20. Signature of the twinning between Alguaire and Vézénobres municipalities (17/09/2024)

Within the framework of the Fig Living Lab, CREDA conducted an experiment with consumers to verify the degree of acceptability and greater willingness to pay for proximity fig jam. For the study, fig jam produced in Alguaire was used, and it was found that information on local and short-channel origin had a positive impact on the hedonic evaluation and willingness to pay of the Catalan consumer.

Figure 21. Auction and evaluation of proximity labels on fig jam

3.4 Main outcomes

The fig industry in Alguaire is expanding, but it is confronted with several obstacles. To address these challenges, the Alguaire Fig Living Lab has facilitated collaboration among stakeholders, with the aim of improving sustainability and profitability in fig distribution for producers and other parties involved. Consequently, recommendations for distribution strategies have been suggested at both the international and domestic levels.

On the one hand, most of Alguaire's production is destined for export to European countries. In this sense, the Spanish stakeholders found it interesting to join the **international promotion activities** facilitated by LAB4SUPPLY: participation in the Fig Fair and twinning with Vézénobres, and promotion of the Mediterranean Fig Route. Capitalizing on the opportunity to place the name of Alguaire, a town in Spain, on the global map of fig producers is a significant promotional chance for the municipality. This move positions Alguaire on par with the leading fig producers in the Mediterranean region. Furthermore, the municipality is strengthening its institutional ties with Vézénobres, a French town that serves as a model for promoting local products, thereby enhancing the promotion of Alguaire's figs. The public administration involved in the Spanish Living Lab has committed to replicate the Maison de la Figue (**House of the Fig**) in the region, given the good results it has produced in Vézénobres.

On the other hand, the promotion of the Alguaire fig brand also has potential at the local level. The Living Lab has identified the **certification of proximity sales**, which incorporates direct sales and short circuit, as a means of enhancing product value and fostering consumer acceptance. As a result, the Living Lab has suggested that farmers consider obtaining this certification to enhance their marketing opportunities within the local community.

4 Chestnut Living Lab in Cévennes (France)

The Living Lab on chestnuts is set in the Cévennes Mountians, one of the most important chestnut producing regions of France.

Living Lab meeting point:
CIHEAM - IAMM (Montpellier, France)

Chestnut Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/cevennes-chestnut-living-lab/

4.1 Context analysis

The approach followed to carry out the analysis included an initial deep literature review. It is complemented by the outputs and results analyse from the quantitative surveys (market structured surveys S1) and semi-structured interviews (deep interviews I1) carried out during Task 1.2. The continuous exchanges with stakeholders and the organisation of discussion groups carried out enabled to complement and better understand the value chains and to draft an initial analysis of the strengths, weaknesses, opportunities and threats (SWOT analysis).

The chestnut sector mobilizes several types of actors with different profiles: farmers, producers, producers/processors, private or collective processing units, distributors, in different forms and statuses (collective, private, supermarket, wholesaler, etc.), associations and institutional actors.

4.1.1 SWOT analysis

Table 3. SWOT analysis for the chestnut supply chain

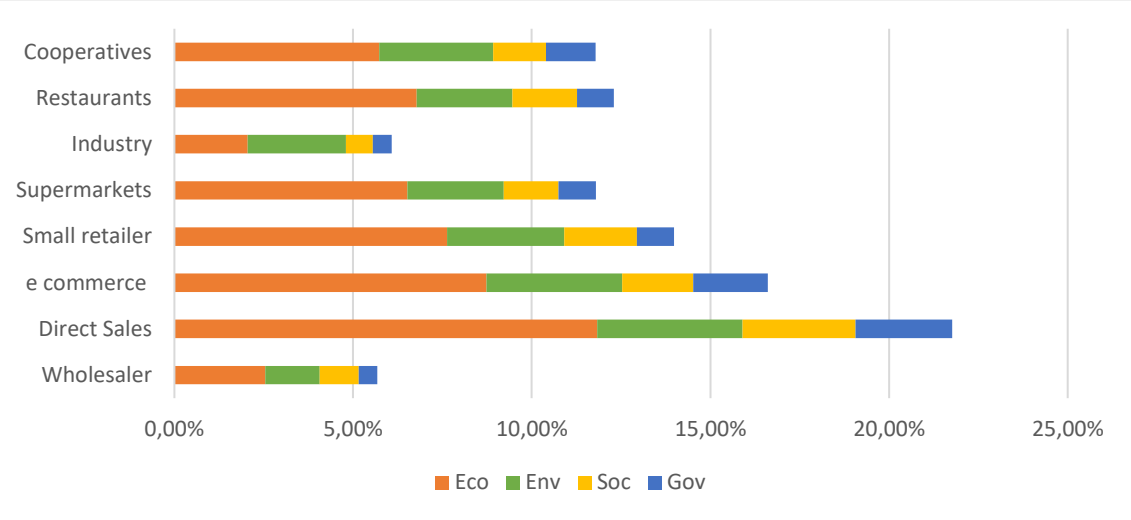
Weaknesses	Strengths
1. Limited Scale: Chestnut production in the region is characterized by small-scale operations, potentially limiting economies of scale and competitiveness.	1. Local Expertise: Producers in the region possess traditional knowledge and expertise in chestnut cultivation, leveraging centuries-old techniques.
2. Seasonality: Fresh chestnuts are highly seasonal, leading to fluctuating revenues and limited market availability outside of peak seasons.	2. Organic Practices: A significant portion of producers engage in organic farming methods, aligning with growing consumer demand for organic products.
3. Dependency on Weather: Chestnut cultivation is susceptible to weather fluctuations, including droughts and	3. Product Diversity: Producers offer a variety of chestnut products, including fresh chestnuts, processed goods like

heatwaves, which can impact yields and quality. 4. Limited Market Reach: Distribution channels may be restricted primarily to local and regional markets, limiting exposure to broader consumer bases. 5. Aging Infrastructure: Some producers may face challenges due to aging infrastructure and limited access to modern agricultural technologies.	cream and flour, catering to diverse consumer preferences. 4. Regional Identity: The chestnut industry is deeply rooted in the cultural and culinary heritage of the Cévennes region, contributing to its unique identity and appeal. 5. Sustainability Focus: Many producers prioritize sustainable practices, such as agroecology and responsible water usage, enhancing long-term environmental stewardship.
Threats	**Opportunities**
1. Climate Change: Increasingly unpredictable weather patterns and extreme events pose risks to chestnut production, including reduced yields and quality. 2. Market Competition: Competition from other chestnut-producing regions or substitute products may challenge market share and pricing competitiveness. 3. Regulatory Changes: Changes in regulations related to agricultural practices, food safety, or labeling requirements may impose compliance burdens on producers. 4. Economic Uncertainty: Economic downturns or fluctuations in consumer spending could impact demand for premium chestnut products. 5. Pest and Disease Pressure: Outbreaks of pests and diseases specific to chestnut trees pose a threat to orchards, potentially leading to crop losses and increased production costs.	1. Market Expansion: There is an opportunity to expand market reach by promoting chestnut products to new consumer segments and exploring export markets. 2. Product Innovation: Producers can innovate by developing new chestnut-based products or value-added offerings to diversify revenue streams and capture consumer interest. 3. Tourism Integration: Leveraging the region's cultural heritage, agritourism initiatives can be developed to attract visitors interested in experiencing chestnut-related activities and cuisine. 4. Sustainable Certification: Strengthening certifications for organic and sustainable practices can enhance marketability and premium positioning in the market. 5. Collaborative Initiatives: Collaborating with research institutions and industry partners can facilitate knowledge exchange, technological advancements, and market development.

4.1.2 Sustainability assessment

Direct sales were found to be the best environmentally friendly method of distribution for chestnuts in France after a study of the various channels; however, e-commerce was suggested as an environmentally friendly alternative for chestnut distribution in France (**¡Error! No se encuentra el origen de la referencia.**).

Figure 22. Sustainability of chestnut distribution channels



4.2 Stakeholder mapping

The following stakeholders were identified:

1. Small-scale and independent farmers.
   Primarily male, with varying ages, education levels, and years of experience in agriculture. Engaged in chestnut cultivation across different altitudes and terrains. Utilize diverse chestnut varieties and employ organic and integrated farming practices.
   Affiliated with different agricultural statuses, such as individual farmers, cooperatives, or associations.

2. Consumers of Chestnuts and Chestnut Products:
   Urban and peri-urban habitants, with a smaller representation from rural areas.
   Diverse demographic profiles, including both genders and various age groups, predominantly with university education.
   Engage in occasional purchases of chestnuts and chestnut-derived products.
   Prioritize factors such as price, quality, seasonality, and locality in their purchasing decisions.

3. Restaurants, Distributors, and Food Industries:
   Include restaurants, distributors, and food processing industries located in the region. Have varying years of experience and operate across different departments within the region.
   Source chestnut products from local producers for use in their culinary offerings or further processing.
   Prioritize factors such as product maturity, demand, packaging, and bulk purchasing options in their sourcing decisions.

4. Research and Academic Institutions:
   Institutes such as the Mediterranean Agronomic Institute of Montpellier, the Center for Agri-food Economy and Development of Barcelona, and the Agricultural University of Athens.
   Contribute to projects like Lab4Supply, providing expertise in agricultural economics, supply chain development, and sustainable agriculture.
   Collaborate in conducting surveys, analyzing data, and providing recommendations for the development of local supply chains.

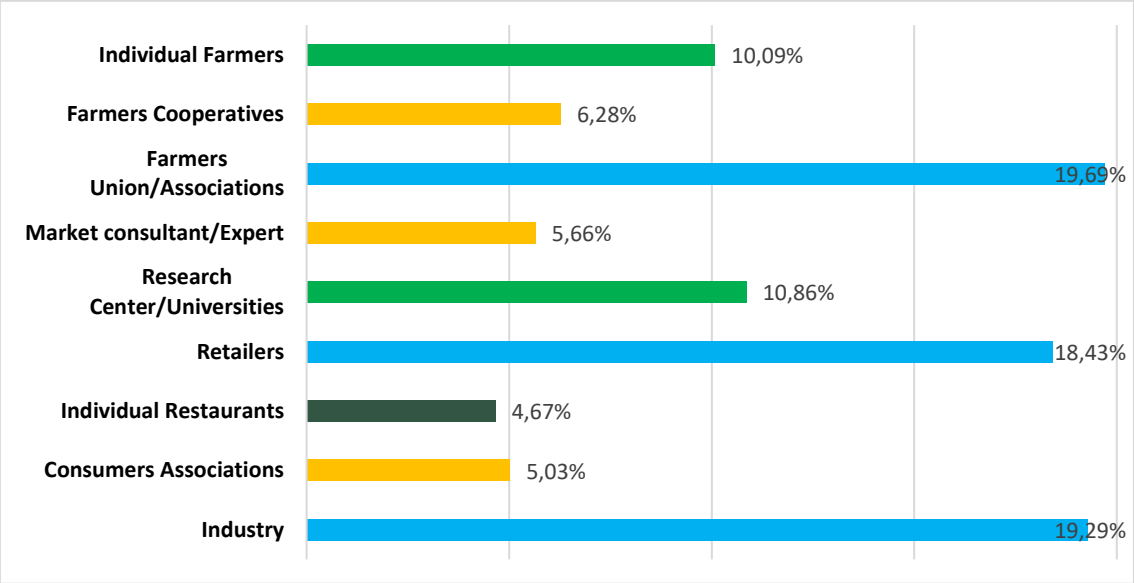
5. Government and Regulatory Bodies:
   Local, regional, and national governmental agencies responsible for agriculture, food safety, and rural development.
   Set regulations, standards, and policies affecting chestnut production, processing, and marketing.
   Provide support, incentives, and funding for initiatives aimed at promoting local agricultural sectors and sustainable practices.

6. Tourism and Hospitality Industry:
   Hotels, bed and breakfasts, tourist attractions, and tour operators in the Cévennes region. Incorporate chestnut-related activities, cuisine, and products into tourism offerings to attract visitors interested in experiencing local culture and gastronomy.

7. Non-Governmental Organizations (NGOs) and Community Groups:
   Organizations and groups focused on environmental conservation, rural development, and community empowerment.
   Support initiatives related to sustainable agriculture, agroecology, and local economic development within the chestnut industry.

According to the prioritization, three of these agents were required for the Living Lab's formation, two were of high importance, three were of moderate importance, and one was of low importance.

Figure 23. Global priorities by stakeholders' type in French Chestnut supply chain.



4.3 Planning

These are the needs and drivers identified for the chestnut supply chain:

AOP Strategies: Marketing and Communication

- ***Need**: With increasing competition and evolving consumer preferences, there is a growing need for Agricultural Organizations of Producers (AOPs) to develop effective marketing and communication strategies.*
- ***Driver**: AOPs aim to promote their products, differentiate themselves in the market, and build brand awareness to attract consumers and increase sales.*
- ***Strategy**: Implementing targeted marketing campaigns, utilizing social media and digital platforms, participating in trade fairs and events, and engaging in product promotion activities.*
- ***Impact**: Effective marketing and communication strategies help AOPs enhance visibility, create demand for their products, and strengthen brand reputation, ultimately driving sales and revenue growth.*

Climate Change Adaptation

- ***Need**: Climate change poses significant challenges to agricultural production, including increased weather variability, shifts in precipitation patterns, and rising temperatures, necessitating adaptation strategies.*
- ***Driver**: Producers recognize the need to adapt their farming practices to mitigate risks associated with climate change, safeguard crop yields, and ensure long-term sustainability.*
- ***Strategy**: Implementing climate-smart agriculture practices such as conservation agriculture, crop diversification, water management techniques, and agroforestry to enhance resilience to climate variability.*

- ***Impact**: Climate change adaptation measures help producers mitigate production risks, maintain stable yields, and safeguard livelihoods, contributing to the long-term sustainability of the agricultural sector.*

Improve Agricultural Practices

- ***Need**: There is a continual need to improve agricultural practices to enhance productivity, efficiency, and sustainability while minimizing environmental impact.*
- ***Driver**: Producers strive to adopt modern farming techniques, utilize innovative technologies, and optimize resource use to achieve higher yields and improve farm profitability.*
- ***Strategy**: Implementing precision agriculture techniques, adopting integrated pest management strategies, optimizing fertilizer and water usage, and investing in agricultural machinery and equipment.*
- ***Impact**: Improved agricultural practices lead to increased productivity, reduced input costs, and minimized environmental footprint, resulting in higher profitability and sustainable farm management.*

Identify New Canals

- ***Need**: Diversifying distribution channels and exploring new markets is essential for AOPs to expand their market reach, increase sales opportunities, and reduce dependence on traditional distribution channels.*
- ***Driver**: AOPs recognize the importance of identifying and leveraging new distribution channels, such as e-commerce platforms, specialty stores, and direct-to-consumer sales, to access untapped markets and consumer segments.*
- ***Strategy**: Conducting market research to identify emerging consumer trends and preferences, forging partnerships with retailers and distributors, and establishing online sales platforms.*
- ***Impact**: Identifying new distribution channels enables AOPs to reach a wider audience, access new markets, and create additional revenue streams, fostering business growth and market resilience.*

4.3.1 Focus groups with key stakeholders

On June 27, 2023, CIHEAM IAMM organized the 1st meeting of the Focus group on the development of the “Cévennes chestnut” sector in collaboration with the association of Cévennes chestnut producers.

We had the opportunity to present the first results of the surveys carried out in 2022 to analyze the sector and to discuss the different levers, opportunities and barriers of the sector and how the LAB4SUPPLY project can support them for better development and influence of the sector.

Figure 24. First Focus Group on the Cévennes chestnut value chain

4.3.2 Workshops

As part of the LAB4SUPPLY project, CIHEAM IAMM organized a day of workshop during October 2023 in partnership with the agro-institute of Montpellier and the national institute and members of the Cévennes chestnut association. Thanks to the presentations of Mr. Nicolas Weber, the territorial engineer at the INAO, and Mr. Fatiha Fort, teacher researcher at the agro-institute of Montpellier, we addressed several points in order to support the players in the sector in promoting the freshly produced AOP obtained. In addition, we worked on the marketing plan such as defense and management organization models (operation, budget, financing, etc.), collective and individual marketing strategies, and the experiences and feedback of other AOP.

Workshop	Living Lab	Thematic
Development of the "Cévennes chestnut" sector	Chestnut LL France	We had the opportunity to present the first results of the surveys carried out in 2022 to analyze the sector and to discuss the different levers, opportunities and barriers of the sector and how the LAB4SUPPLY project can support them for better development and influence of the sector.
Marketing of a Protected Denomination of Origin for Chestnut.	Chestnut LL France	has presented and addressed several points in order to support the players in the sector in promoting the freshly produced **PDO** obtained. In addition, we worked on the marketing plan such as: defense and management organization models (operation, budget, financing, etc.), collective and individual marketing strategies and the experiences and feedback of other PDO.

4.3.3 Training capsules:

The training capsules are a compilation of videos of the conference “Gestion de l’AOP Châtaignes des Cévennes et marketing” held in October 19, 2023, at Chambre d’agriculture du Gard-Antenne d’Alès (France). They can be retreived from: https://www.lab4supply.eu/chestnut-video-capsules/

- Video capsule #8 Fonctionnement des organismes de defense et de gestion: https://youtu.be/bFtjkNgRPyQ
- Video capsule #9 Overview of Geographical Indications and major challenges: https://youtu.be/V2_OI2p3dK0
- Video capsule #10 Quelles images sont associées aux Cévennes (enquête aux consommateurs): https://youtu.be/XN9ladynOFI
- Video capsule #11 Retours d’expériences et outils de communication (AOP Pélardon): https://youtu.be/QU6hNsbtjjw

4.4 Main outcomes

The chestnut living lab had one focus group and several workshops as well. The 1st meeting of the Focus group on the development of the “Cévennes chestnut” sector in collaboration with the association of Cévennes chestnut producers. We had the opportunity to present the first results of the surveys carried out in 2022 to analyze the sector and to discuss the different levers, opportunities and barriers of the sector and how the LAB4SUPPLY project can support them for better development and influence of the sector. Moreover, the as part of the LAB4SUPPLY project, CIHEAM IAMM organized a day of workshop during in partnership with the agro-institute of Montpellier and the national institute and members of the Cévennes chestnut association. We were able to address several points in order to support the players in the sector in promoting the freshly produced AOP obtained. In addition, we worked on the marketing plan such as: defense and management organization models (operation, budget, financing, etc.), collective and individual marketing strategies and the experiences and feedback of other AOP.

MAIN INPUTS OR CONTRIBUTIONS OF THE LL
The formation of a strong relationship between different stakeholders of the chestnut in the Cevennes region, nevertheless, sharing the knowledge and experience of main producers.

PROBLEMS IDENTIFIED BY THE LL
The difficulty of finding experienced labor in the production of the Chestnut where there is a limitation in the agricultural practices. With the limited scale identified, the productions' seasonality depends on the weather.

FUTURE LINES OF ACTION PROPOSED BY THE LL
New business opportunities for the Chestnut producers.

5 Fig Living Lab in the Gard (France)

The fig living lab in France was located in the village of Vézénobres, which has a consolidated sector thanks to the work carried out by the Maison de la Figue and promotional events such as the Jours des figues.

Living Lab meeting point:
Maison de la Figue, Vézénobres, France

Fig Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/platforms-fig/

5.1 Context analysis

The fig value chain in the Gard region encompasses several crucial stages, beginning with cultivation. Here, fig trees are carefully tended to by growers who employ traditional know-how and sustainable practices, ensuring optimal growth and yield. During the harvest season, which typically spans from August 15 to November 15, skilled workers hand-pick ripe figs, adhering to specific criteria such as color and condition. Following harvest, the figs undergo meticulous sorting and packaging procedures to maintain their quality during transportation. Logistics coordination facilitates the efficient movement of figs from orchards to various distribution points, including local markets and processing facilities. Some figs may undergo additional processing, such as drying or preserving, to create value-added products like dried figs or jams.

Marketing efforts focus on promoting the unique characteristics of Gard figs through collaborations with wholesalers and retailers, and participation in local events like the Fig Festival. Ultimately, Gard figs are cherished for their historical, cultural, and gastronomic significance, contributing to the region's identity and economy while providing consumers with exceptional culinary experiences.

5.1.1 SWOT analysis

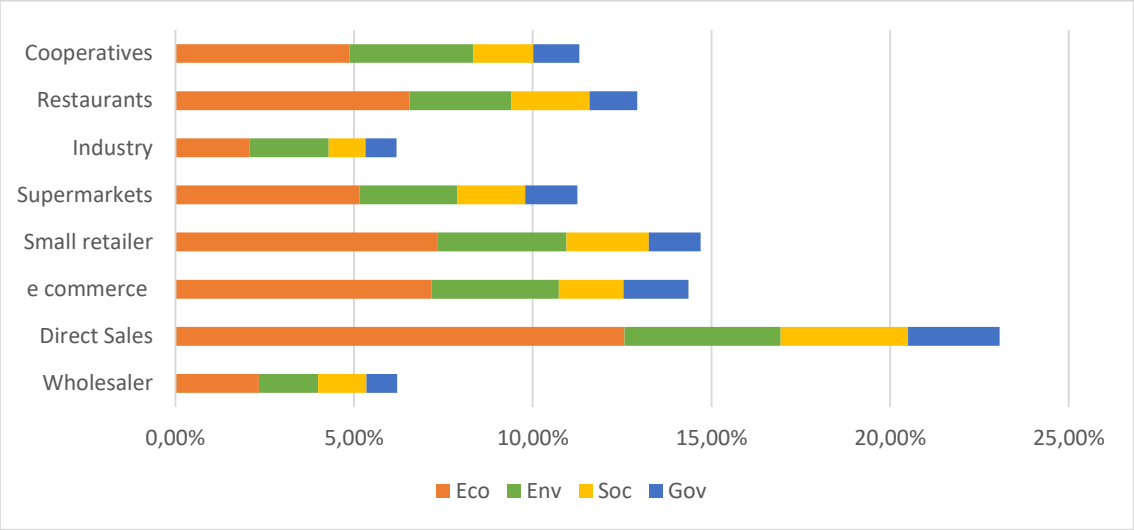
Table 4. SWOT analysis for the fig supply chain (France)

Weaknesses	**Strengths**
With the lack of technical expertise, there is a lack of an economic market for figs. In addition, the presence of a competition from more structured offers that is leading to decreasing the prices. Regarding the national and local events, the absence of the fig products on display at events was noticeable which shed the light on the importance of this initiative for providing exposure for the products. Moreover, the lack of entertainment (competition, games) compared to other events was found to be essential for the engagement of the consumer. Finally, a weak link in the fig supply chain between the showcasing projects and producers, in addition to the absence of partnerships between different French and foreign villages.	There exists a significant historical and cultural connection between the region under study and figs. It appears clearly in the existence of fig festival and cultural as well as culinary event involving visits to the orchard and a local market. International collaborations have been initiated through the Euro-Mediterranean Fig Days. The economic potential of both fresh and processed figs is notable. Producers are keen on adopting a unified strategy to enhance their branding and distinguish themselves in the market.
Threats	**Opportunities**
First, there is a low production of figs that is due to the low number of fig producers found. Second, the competition in this field turns towards national or international competition. Thirdly, the limitation of the production in a strictly festive touristic logic which makes it appear as a restricted domain. Finally, the threat of facing climatic hazards (flooding, drought) that will lead to the degradation of the landscape that isn't linked to the tourism development policy.	Although the fig orchard is ignored, it can lead to new projects especially with its popularity from the public when being exposed with the potential for marketing in short circuits for adapted commercial strategies in nearby areas. Nevertheless, there is very little competition from local and departmental audiences ensuring its success with an expanded audience range starting from the Mediterranean.

5.1.2 Sustainability assessment

The findings showed that restaurants, retailers, and e-commerce were all viable possibilities for the sustainable distribution of French figs, whereas direct sales were the most sustainable distribution channel.

Figure 25. Sustainability of French fig distribution channels



Sustainable indicators of the value chain refer to specific criteria used to assess the economic, environmental, social and governance sustainable indicators of various stages within the fig value chain. These indicators help the stakeholders understand the impact of their operations and identify areas for improvement towards sustainability goals.

Economically, the fig production isn't held as a primary income for its producer which makes it unprofitable. The price is considered as expensive which reflects the cost production being high as well.

Environmentally, In the case of fig production with the focus on traditional practice and lack of innovation, the low technical knowledge might be reflected in the agricultural practice used in the production which appears in the material used and energy consumption.

Socially, labor is limited to a max of four workers with no discrimination between males and females.

Regarding governance, the fig supply chain is a transparent one which makes the stakeholder engagement and their activities easier. Nevertheless, having different stakeholders from different regions creates a link connecting them despite the cultural and linguistic barriers

5.2 Stakeholder Mapping

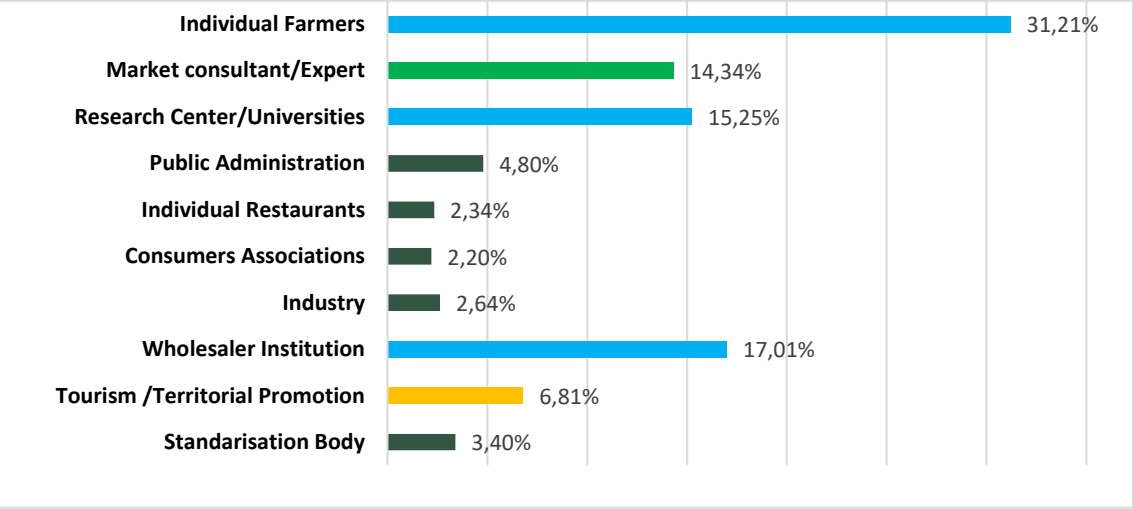
The main fig growers are either arborists or wine growers interested in diversifying their agricultural activities and securing their income by growing crops that are more resistant to drought and climate change. 28% are just figs. The rest of the fig presents a diversification in their agricultural activities: legume or tubers. The production of figs, processed or not, is rarely the sole or main activity of farmers. It always constitutes additional income for viticulture, tree crops or cereals. This supplement is however appreciated in terms of cash flow during the summer period.

Fig growers	Farmers cultivating fig trees, ranging from traditional orchards to experimental plots. Engaged in planting, nurturing, and harvesting figs, often adopting sustainable practices. Represent a diverse group including arborists, wine growers diversifying their crops, and those converting to agriculture.
Artisanal Processors	Individuals or small-scale enterprises involved in processing figs into value-added products. Examples include producers of dried figs, jams, cakes, and other culinary delights. Enhance the market offerings and diversity of fig products, often promoting local flavors and traditions.
Local Communities	Residents of the Gard region with a vested interest in fig-related activities. Contribute to the cultural heritage and gastronomic identity associated with fig cultivation. Participate in fig festivals, events, and support local producers through consumption and engagement.
Agricultural Institutions	Organizations providing support, guidance, and expertise to fig growers. Includes the Chamber of Agriculture of Gard and other agricultural extension services. Offer training, technical assistance, and promote best practices for fig cultivation.
Tourism Sector	Entities involved in promoting tourism and gastronomic experiences in the Gard region. Collaborate with fig-related initiatives to attract visitors and showcase local culinary traditions. Contribute to the economic development of the region through tourism activities centered around figs.

Government Agencies	Public authorities responsible for policy-making, regulation, and funding allocation. Provide support for fig sector development, including grants, incentives, and infrastructure. Ensure compliance with agricultural standards and environmental regulations.

In France, Fig had a supply chain with ten links. The criteria prioritizing showed the importance of each stakeholder. According to the priority they represented, two main groups of actors stood out for the Living Lab: on the one hand, four groups identified as high important, and on the other hand, six groups identified as less important.

Figure 26. Global priorities by stakeholders' type in French Fig supply chain.



5.3 Planning

As result of the context analysis and stakeholders mapping, the following objectives were set for the Planning stage of the Living Lab:

Priority 1: Cultivation and Production Enhancement

- Increase fig production and quality in the Gard region.
- Promote sustainable cultivation practices among fig growers.
- Enhance the diversity of fig varieties cultivated in the region.

Priority 2: Value Addition and Marketing

- Develop value-added fig products to diversify the market offerings.
- Strengthen marketing strategies to promote local fig products.
- Establish partnerships with wholesalers and retailers to expand market reach.

Priority 3: Stakeholder Engagement and Collaboration

- Foster collaboration among fig growers, processors, and other stakeholders.
- Facilitate knowledge sharing and exchange of best practices within the fig sector.
- Engage with local communities and authorities to garner support for fig-related initiatives.

5.3.1 Focus groups with key stakeholders

The 1st meeting of the Living-Lab on the Fig value chain was held in Vézénobres in March, 2023.

Figure 27. First Focus Group On The Fig Value Chain In Vézénobres

5.3.2 Workshops

Workshop	Living Lab	Thematic
Cultivating Connections: Insights and Recommendations for the Fig Industry in the Gard region	Fig LL France	Agricultural initiatives should focus on restructuring orchards in collaboration with the pomology centre. Processing opportunities, particularly in the dried fig sector, should be focused on due to high demand. Marketing efforts should aim to promote Gard figs regionally and facilitate connections between producers and processors.

The workshop held on **February 14th** in **Vézénobres** marked the inaugural event in a series organized by the Institut Agronomique Méditerranéen de Montpellier under the Lab4Supply Euro-Mediterranean project.

The workshop commenced with a presentation of its objectives:

1. Identify opportunities within distribution and marketing channels.
2. Identify existing and potential needs within the sector.
3. Recognize innovations that could enhance the fig industry.
4. Establish a multi-stakeholder working group to foster collaboration.
5. Understand and discuss stakeholders' preferences and priorities.
6. Asses stakeholders' capacity to adapt to challenges such as climate change and crises.
7. Facilitate dialogue and strengthen relationships among stakeholders, including producers, processors, traders, wholesalers, consumers, and decision-makers.

Subsequently, the workshop attendees were briefed on the results of surveys conducted from June to October 2022 among various stakeholders in the fig sector of the Gard region, including farmers, distributors, processors, restaurateurs, and consumers. While the survey provided a general overview of industry trends in Gard, it highlighted the burgeoning niche sector, with an increasing number of younger farmers turning to fig cultivation to diversify and add value to their production. The primary distribution channels identified were direct sales and local markets, although workshop participants noted significant international activity by wholesalers. Sales prices were reported to range between €9 and €4 per kilogram.

Moreover, the survey underscored the potential for figs to occupy a niche position in the region's market, considering prevailing prices compared to other fig products in France. Additionally, it revealed consumer demand for fresh figs, which are often inaccessible locally. Processed fig products such as jam and dried figs were also found to be in demand for various culinary purposes, although processing activity in Gard remains limited.

Following discussions and feedback, several challenges and issues facing the Gard sector were identified, including labor availability, orchard structure affecting harvest duration, difficulties in sourcing figs for processors and artisans, national and international competition, and the untapped potential of a dried fig sector.

During the workshop, students from the M2 Climate Change, Agricultural Management, and Territory program shared insights into fig promotion and development in Mediterranean countries:

1. In **Southern France,** figs are used in sorbets, fig flower-based products, and bread made from chestnut flour.
2. **Algeria** features figs in traditional cakes, chocolates, and modern pastries, with dried figs commonly sold in jars with olive oil.
3. **Lebanon** incorporates dried figs into festive treats filled with dried fruits like walnuts or almonds.
4. **Tunisia** promotes fresh figs, jams, dried figs, and syrups through cooperatives in Berber villages, leveraging international fairs, online platforms, and festivals.

5. **Morocco**, like other Maghreb countries, integrates figs into culinary traditions such as tajines and Maghrebian pastries, while also focusing on research to improve processing methods.

The workshop concluded with three key recommendations to support sector development:

1. Agricultural initiatives should focus on restructuring orchards in collaboration with the pomology center.
2. Processing opportunities, particularly in the dried fig sector, should be identified and revitalized.
3. Marketing efforts should aim to promote Gard figs regionally and facilitate connections between producers and processors.

Workshop	Living Lab	Thematic
Celebrating the Fig: Enhancing Cultivation and Water Management Across the Mediterranean	Fig LL France	Focused on optimizing water resources on fig's cultivation.

In September, CIHEAM IAMM collaborated with the Maison de la Figue, INRAE UMR G-EAU, and the Gard Chamber of Agriculture to host an insightful workshop focused on optimizing water resources. The event drew participation from a diverse group, including farmers from the Gard and Spain, nurserymen, and research institutions from Morocco, Spain, and Algeria. Among the highlights was a presentation by Cyril Dujean, a researcher at INRAE UMR G-EAU, who shared valuable tools for sustainable water management specifically tailored for fig trees. The topic sparked lively discussions among attendees, all of whom grapple with the challenges posed by climatic hazards and drought.

Additionally, in collaboration with the Maison de la Figue and the Vézénobres Remarkable Taste Site, CIHEAM IAMM organized a captivating round-table discussion on fig cultivation and production across the Mediterranean region. The event brought together experts and practitioners from the Gard, Spain, Morocco, and Algeria, including esteemed nurseryman Pierre Baud. Participants seized the opportunity to exchange invaluable insights and ancestral agricultural wisdom, fostering a rich exchange of experiences. Notable contributors included partners from the CREDA project, INRA Morocco, the University of Sultan Moulay Slimane, and the University Mouloud Mammeri of Tizi Ouizou, among others. The engaging session kicked off with a visit to the conservatory orchard of the Maison de la Figue, where Pierre Baud and Sandrine Rauzier, director of the Pomology Center in Alès, showcased an impressive array of 100 fig varieties and offered insights into effective tree management practices."

Workshop	Living Lab	Thematic
Fig Days: Cultivating Connections and Sharing Mediterranean Delights	Fig LL France	This event connected the town halls of Vézénobres and Alguaire, situated in the province of Lleida, Spain During the “Jours de figues” the CIHEAM-IAMM and the Maison de la Figue jointly organized a public conference titled "THE FIG IN THE MEDITERRANEAN". The LAB4SUPPLY project showcased a diverse array of fig-derived products at their stand which featured different partners from Algeria, Spain, and Morocco.

With the collaborative efforts of CIHEAM IAMM and CREDA under the LAB4SUPPLY project, the Fig Days event on September 16/17 marked the initiation of a significant twinning project. This inaugural endeavor connected the town halls of Vézénobres and Alguaire, situated in the province of Lleida, Spain, renowned as the third-largest fig-growing region with an annual production exceeding 3,000 tonnes. Gratitude is extended to Mayor Sébastien Ombras of Vézénobres and Mayor Inma Roca of Alguaire for their pivotal roles in this partnership.

Amidst the Fig Days festivities, CIHEAM IAMM and the Maison de la Figue jointly organized a public conference titled "THE FIG IN THE MEDITERRANEAN". The event featured insightful commentary from our esteemed partners and guests from Algeria, Spain, and Morocco. Each representative provided an overview of fig cultivation in their respective countries, highlighting key growing regions, processing techniques, value-added products, and the challenges posed by climate change. Additionally, attendees had the opportunity to sample processed fig products from each region. Heartfelt thanks are extended to the enthusiastic audience for their participation and engagement.

CIHEAM IAMM actively participated in the public conference "Presentation of varieties from the Vézénobres orchard", led by renowned pomologist Sandrine Rauzier from the Alès Pomology Center. This session provided valuable guidance to attendees on selecting appropriate fig varieties for their gardens and offered insights into proper care and cultivation practices.

At the bustling Fig Days Market, the LAB4SUPPLY project showcased a diverse array of fig-derived products at their stand. From delectable dried figs to sumptuous fig paste and jams, visitors were treated to a tantalizing tasting experience. Our heartfelt appreciation goes out to our partners at CREDA, INRA Morocco, and the University of Sultan Moulay for their invaluable contributions to these enriching moments of shared indulgence.

5.3.3 Training capsules:

The video capsules of the fig living lab come from the conference within the framework of the round table ”The fig in the Mediterranean” held during the Jours de Figues de Vézénobres (Gard, France), on September 16, 2023.

Link to the web: https://www.lab4supply.eu/jours-de-figues-video-capsules/

- Video capsule #12 La Figue & le Figuier une incroyable diversité https://youtu.be/pVOkavf0bM0
- Video capsule #13 Outils pour la gestion hydrique https://youtu.be/lW0nRPvLYpM
- Video capsule #14 La figue en Espagne https://youtu.be/Vrv_jarHtb8
- Video capsule #15 La figue en France et dans le Gard https://youtu.be/RfiZ7vij-3k
- Video capsule #16 Le figuier au Maroc https://youtu.be/6hfYYui0j8Y

5.4 Main outcomes

Concerning the Figs in France, one focus group and several workshops were carried out. The advancement of the fig industry is essential to identify opportunities within distribution and marketing channels, recognizing both existing and potential needs within the sector. There are several innovations that can be adapted in order to enhance it. The establishment of a multi-stakeholder working group will foster collaboration, bringing together diverse perspectives to understand and discuss stakeholders' preferences and priorities. This collaborative effort should also assess stakeholders' capacity to adapt to challenges such as climate change and crises. The dialogue among producers, processors, traders, wholesalers, consumers, and decision-makers will ensure a cohesive approach to advancing the industry.

The analysis of the surveys conducted in the Gard region that provided a general overview of industry trend, it highlighted the fig as a niche product, with an increasing number of younger farmers turning to fig cultivation to diversify and add value to their production. The primary distribution channels identified were direct sales and local markets, although workshop participants noted significant international activity by wholesalers. Sales prices were reported to range between €9 and €4 per kilogram.

Additionally, it revealed consumer demand for fresh figs, which are often inaccessible locally. Processed fig products such as jam and dried figs were also found to be in demand for various culinary purposes, although processing activity in Gard remains limited.

Following discussions and feedback, several challenges and issues facing the Gard sector were identified, including labor availability, orchard structure affecting harvest duration, difficulties in sourcing figs for processors and artisans, national and international competition, and the untapped potential of a dried fig sector.

In addition, there were shared insights into fig promotion and development in Mediterranean countries such as Southern France, figs are used in sorbets, fig flower-based products, and bread made from chestnut flour, Algeria features figs in traditional cakes, chocolates, and modern pastries, with dried figs commonly sold in jars with olive oil, Lebanon incorporates dried figs into festive treats filled with dried fruits like walnuts or almonds, Tunisia promotes fresh figs, jams, dried figs, and syrups through cooperatives in Berber villages, leveraging international fairs, online platforms, and festivals, Morocco, like other Maghreb countries, integrates figs into culinary traditions such as tajines and pastries, while also focusing on research to improve processing methods.

The recommendations are on three level Agricultural initiatives should focus on restructuring orchards in collaboration with the pomology center, Processing opportunities, particularly in the dried fig sector, should be identified and revitalized and Finally, Marketing efforts should aim to promote Gard figs regionally and facilitate connections between producers and processors.

Several workshops were carried out. The fig producers were provided with valuable tools for sustainable water management specifically tailored for this type of production. This is an important topic with the rise of climatic challenges of drought and hazards. Furthermore, the organization of a captivating round-table discussions on fig cultivation and production across the Mediterranean region. Others events brought together experts and practitioners from the Gard, Spain, Morocco, and Algeria, the Pomology Center in Alès, showcased an impressive array of 100 fig varieties and offered insights into effective tree management practices." They highlighted key growing regions, processing techniques, value-added products, and the challenges posed by climate change. Additionally, attendees had the opportunity to sample processed fig products from each region.

At the Fig Days Market, the LAB4SUPPLY project showcased a diverse array of fig-derived products at their stand. From delectable dried figs to sumptuous fig paste and jams, visitors were treated to a tasting experience.

MAIN INPUTS OR CONTRIBUTIONS OF THE LL
Exchange of knowledge between different stakeholders and countries.

PROBLEMS IDENTIFIED BY THE LL
Price of figs is expensive Production is unprofitable due to high cost and low revenue. Structure of Fig trees needs to be adjusted and adapt

FUTURE LINES OF ACTION PROPOSED BY THE LL
The Mediterranean Fig Route Website

6 Carob Living Lab in Morocco

LAB4SUPPLY in Morocco chose carob as a case study. Thus, USMS and INRA Morocco have promoted a Living Lab to improve carob production and marketing in the Béni Mellal region.

Living Lab meeting point:
Centre Régional de la Recherche Agronomique du Tadla (Béni Mellal, Morocco)

Carob Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/moroccan-carob-living-lab/

6.1 Context analysis

USMS & INRA has contacted various stakeholders in the Béni Mella region Carob chain and has attended a meeting in the Agropol INRA of Béni Mellal (March 7, 2023). USMS & INRA In these meetings, we have gathered the following information from producers, processors, distributors and public administration.

We can see how this region is central to the Moroccan carob chain:

- The growth of fig cultivation in Béni Mellal region has been exponential in recent years for many raisons.
- There is lot of associations and cooperatives of the local carob producers and the local administration is committed to the promotion of this product.
- The carob tree in the region exceeds 250,000 ha, or more than 20% of national production

However, the farmers consulted highlight certain problems to be raised:

- The latest drops in carob prices in Morocco in recent years have created a feeling of distrust and uncertainty among farmers and cooperatives.
- **Lack of trust** between farmers and cooperatives impacts price negotiation power throughout the value chain

Some actions have been put on the table, for example:

- **To obtain more formation about valorization and commercialization techniques**
- Increase **agronomic knowledge** about carob cultivation.
- To **improve the quality and make known a different uses of carob**

6.1.1 SWOT analysis

Table 5. SWOT analysis for the carob supply chain

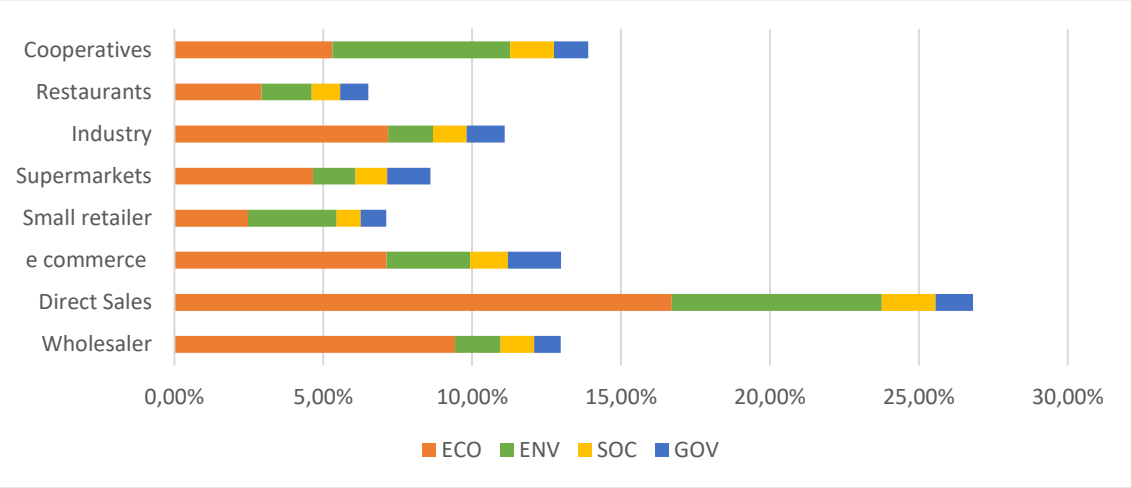
Weaknesses	Strengths
Lack of Valorization: There is a lack of added value processes in the sector, such as the transformation into finished products (carob powder, carob gum, etc.). **Sector Structure:** Fragmentation and lack of organization among small producers who dominate the sector, limiting their ability to negotiate higher prices. **Infrastructures and Technologies:** The lack of investment in modern production and processing infrastructure limits the quality and quantity of production. **Management of Cooperatives:** Although the forestry cooperatives create jobs, there are still management gaps. **Neglect of the Sector:** Despite its potential, the carob sector is often neglected. Yet, it could replace wheat and cocoa, meeting local market needs and boosting exports. **Low Cultivated Area:** Although the area of carob plantations has increased in recent years, it remains insufficient compared to the potential demand. Currently, about 18,160 hectares are dedicated to this crop, but the goal is to reach 100,000 hectares by 2030.	**Climatic resilience:** The carob tree is adapted to arid conditions and can thrive in sunny Mediterranean regions. Its ability to withstand drought makes it a promising crop for semi-arid and marginal lands. **Production and Importance:** • Morocco is the world's second-largest producer of carob, with an average production of 60,000 tons per year. • The carob tree is resistant to harsh climatic conditions and can be cultivated in sunny Mediterranean regions. • Currently, there are about 68,000 hectares of carob trees in forest areas managed by the National Agency for Water and Forests (ANEF) and 12,000 hectares in private domains, mainly in the Béni Mellal-Khénifra region. **Growing demand:** The demand for carobs is on the rise, both nationally and internationally, especially in the food and cosmetic industries. Morocco mainly exports to Europe (Spain and Italy). **Government strategy:** Morocco has launched the "Forests of Morocco 2020-2030" program aiming to increase the area of carob trees in private and forest domains. The goal is to reach 100,000 hectares by 2030, thus enhancing the resilience of forests to climate change. **Tradition and expertise:** The carob tree is traditionally cultivated in Morocco, which ensures knowledge and cultural experience.

Threats	Opportunities
Climate Change: Morocco, like many Mediterranean countries, faces unprecedented drought conditions. Water scarcity can affect the production and distribution of carob trees. **International Competition:** Other carob-producing countries can influence prices and markets. Morocco must remain competitive to maintain its position as the world's second-largest producer. **Lack of Organized Structures:** The economic exploitation of the carob tree is hindered by a lack of structuring and organization in the sector. Although forest cooperatives are beneficial, they have gaps in management skills. **Market Dependency:** For producers focusing on a limited number of clients or markets, fluctuations in demand and prices can pose a significant threat.	**Valorization of Semi-Arid and Marginal Lands:** The carob tree is a crop well-suited to these challenging conditions. Its roots can penetrate different soil types, even rocky ones, making it a promising option for combating desertification and soil erosion. **Competitiveness in Carob Production and Valorization:** Morocco boasts high yield levels when crushing carob pods, thus having the potential to significantly improve its competitiveness and become the world's leading producer. **Strategic Sector and Profitability:** In addition to the olive tree, the carob tree is one of the priority sectors of the Green Morocco Plan (PMV). It is considered one of the most profitable fruit trees in the Azilal province. **Morocco's Forest Programme 2020-2030**: The government aims to increase the area of carob trees in private and forest domains. **Socio-Economic Impact:** The valorization of the carob tree can contribute to the development of rural areas and the sustainability of forest ecosystems. **Emerging Market:** The growing demand for organic and natural products offers new market opportunities for carob-based products. **Product Diversification:** There is potential to develop a wide range of products derived from carob (food, beverages, health products, and cosmetics) for different market segments.

6.1.2 Sustainability assessment

According to the findings, distribution of carob through cooperatives, industry, e-commerce, and wholesale are comparable options to direct sales, which is thought to be the most environmentally friendly mode of distribution (**¡Error! No se encuentra el origen de la referencia.**).

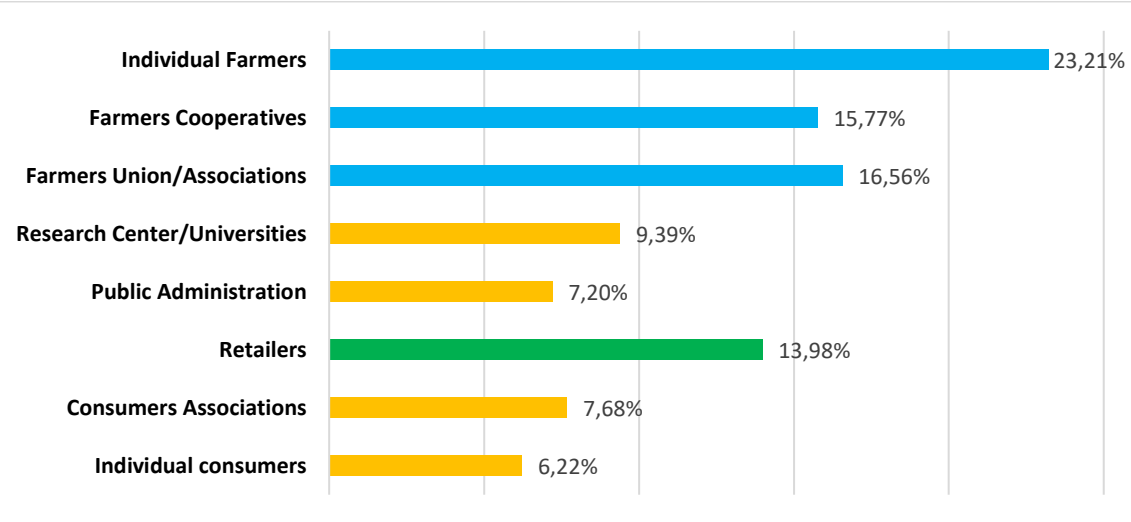
Figure 28. Sustainability of carob distribution channels



6.2 Stakeholder mapping

The most important stakeholders identified in the supply chain were farmers (individual farmers, associations and cooperatives). Retailers also had a significant weight.

Figure 29. Global priorities by stakeholder' type in Moroccan carob supply chain



6.3 Living Lab main activities

The activities of training were oriented to carob producers in Béni Mellal region, especially the agronomical aspects in one hand and the production and commercialization in the other hand.

In order to carry out these activities, the Living Lab collaborated with the IKSASEN cooperative and ONCA to exchange experiences of production and commercialization of Carob in the national and international markets.

6.3.1 Focus groups

FOCUS GROUP 1 (07/03/2023)

P1. Tagant cooperative responsible
P2. Quality responsible SANAD
P3. Provincial center of agriculture
P4. Tagant cooperative farmer
P5. Head of agricultural advice centre the ait atab
P6. President cooperative kharoubi
P7. Agricultural technician
P8. Academic Researcher
P9. Scientific Researcher
P10. Carob industry
P11. Agricultural advisor
P12. Scientific Researcher
P13. Scientific Researcher
P14. Scientific Researcher
P15. Scientific researcher
P16. Industry
P17. Carob association
P18. Farmer

The first focus group was designed based on the needs expressed by the stakeholders: to guarantee a fairer price for the producer. For this, it is important to bring together the stakeholders of the chain, from producers, businesses and institutions to discuss strategies that give more value to the local carob. the valorization and industrial transformation of carob can give a significant boost and a gain in terms of added value.

Figure 30. First Focus group on the carob value chain at Ouezzane (North Morocco)

6.3.2 Workshops

Workshop	Living Lab	Thematic
Carob Production and Commercialization	Carob LL Morocco	Hassan Ouabouch (agricultural economist and value chain expert) Kaoutar El Fazazi (specialist and expert in quality and technological development of agricultural products) DATE: 28/042023 Participants: 25 stakholders Workshop in situ.
Technical maintenance of trees, different uses of carob, price situation in world markets	Carob LL Morocco	Hassan Ouabouch: agricultural economist and value chain expert Kaoutar el Fazazi: specialist and expert in quality and technological development of agricultural products Layachi Eddabbeh: President of the regional association of carob producers Marrakech Safi General Secretary of the National Association of Carob Producers MENA regional expert Fatima ezzahra Eddabbeh: carob expert DATE: 25/05/2024 Participants: 16 stakholders Workshop in situ.

6.4 Main outcomes

The situation of the CAROB sector in the Béni Mellal region is quite important, in fact Béni Mellal is the first carob producing region in Morocco, and presents enormous opportunities in the future and also the conversion of crops into carob by climatic reasons in recent years. This generates the problem of sales and price instability without forgetting the multiplication of intermediaries. Moroccan carob is known for its superior quality on the international market. the main challenge is to find buyers, especially the international market, and also to guarantee attractive prices and minimize the high price volatility that has marked recent years.

The activities of the Carob Living Lab were focused on providing carob producers with tools to improve the conditions of cultivation, distribution, and sale of their product. The application time of the workshops and capsules allowed continuous training for the farmers.

The main risk was the availability of farmers to attend the workshops, it was difficult to convince them at the beginning and involve them in order to create a climate of exchange on the different problems and difficulties.

The training workshop played a fundamental role in the explanation and techniques of cultivation and maintenance of the carob tree, as well as the commercial aspect through distribution channels as well as the valuation and determinants of the price of carob at national and international levels.

Carob producers, almost by consensus, agreed on fundamental aspects for the sector, the first being training in carob production and harvesting; the second the diversification of distribution channels and the third aspect related to training in new sales techniques in order to follow the evolution and globalization of international markets. These positions were supported by public and academic actors...etc.

7 Fig Living Lab in Morocco

In Morocco, the LAB4SUPPLY partners developed the activities of the Living Lab of the fig in the Ouezzane area. Fig trees are emblematic fruit trees of the Moroccan landscape. They are widely cultivated in the semi-arid regions of Morocco, where climatic conditions are favorable for their growth. Fig trees have great cultural significance in Morocco, where they are considered a symbol of fertility, generosity and well-being. They also play an important role in Moroccan cuisine, where figs are used in many sweet and savory dishes.

Living Lab meeting point:
KM 8, El Jadida, Street, Oasis Casablanca, Morocco

Fig Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/platforms-fig/

7.1 Context analysis

USMS & INRA contacted various stakeholders in the Ouezzane chain and attended a meeting in the Jnan Rif cooperative in Ain Bayda Ouezzane (April 28 2023). USMS & INRA In these meetings, we gathered the following information from producers, processors, distributors, and public administration.

We can see how this region is central to the Moroccan fig chain:

- The growth of fig cultivation in Ouezzane region has been exponential in recent years for many reasons.
- There are lot of associations and cooperatives of the local carob producers, and the local administration is committed to the promotion of this product.
- The traditions of the fig as well as the favorable climatic conditions for the cultivation of the fig.
- Fig production in Morocco 109,620 T in 2022 (FAOStat, 2024),
- Fig cultivation occupies an area of 3,150 hectares in the Ouezzane region, one of the most fig-producing regions at the national level.

However, the farmers consulted highlighted certain problems to be raised:

- The latest drops in carob prices in Morocco in recent years have created a feeling of distrust and uncertainty among farmers and cooperatives.
- **Lack of trust** between farmers and cooperatives impacts price negotiation power throughout the value chain
- The impact of drought on the quality and quantity of figs in the region, as well as storage and sustainable packaging issues.

Some actions were put on the table, for example:

- **To obtain more formation about valorization and commercialization techniques**
- Increase **agronomic knowledge** about fig cultivation.
- How to use and economize the water and improve fig yield

7.1.1 SWOT analysis

Table 6. SWOT analysis for the carob supply chain

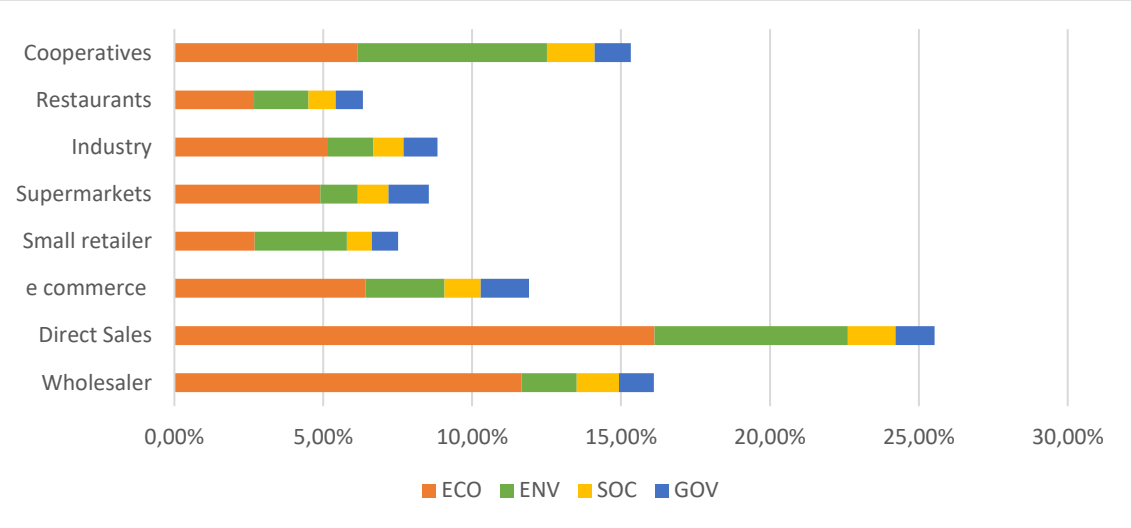
Weaknesses	Strengths
Lack of structure: Despite the significant cultivated area, the sector lacks organization and structure, which can hinder the marketing and enhancement of products. **Age of orchards:** Some orchards are very old and are still managed in a traditional manner, which requires rehabilitation work. **Yields:** Despite the large cultivated area, the average yield remains relatively low, at about 1.2 tons per hectare. Efforts to improve productivity are necessary. **Geographical isolation:** Some fig-producing regions are remote from major urban centre's, which can limit access to markets and processing infrastructures. **Fragmented production structures:** Many small producers with small-scale farms limit economies of scale and efficiency. **Lack of technology and preservation methods:** Traditional farming methods prevail, and there is an increased need for modern preservation techniques to improve quality and shelf life. **Inadequate supply chain and distribution:** Lack of adequate infrastructure for harvesting, storage, packaging, and transportation. **Production fluctuations:** Dependence on weather conditions that can affect the quantity and quality of crops.	**Adapted Climate**: Morocco has an ideal Mediterranean climate for fig cultivation, with hot and dry summers and mild winters, conducive to the growth of fig trees. **Cultivated Area:** Morocco has a total surface area of around 62,000 hectares dedicated to fig cultivation. **Annual Production:** The national production reaches approximately 120,000 tonnes per year. **Job Creation:** Fig cultivation generates around 2 million workdays per year, equivalent to approximately 10,000 stable jobs. **Global Positioning:** Morocco ranks 4th in the world in terms of fig production, thanks to the efforts of the Green Morocco Plan and the interest in this sector. **Local Varieties and Biodiversity:** There are numerous local varieties of figs in Morocco, well adapted to the climatic and ecological conditions, offering a diversity of tastes. The country boasts a wide variety of figs, well suited to the local conditions, which have the potential to attract different markets. **Tradition and Expertise:** Fig cultivation is deeply rooted in Moroccan tradition, with farming and harvesting methods passed down from generation to generation.

Water requirement: The cultivation of fig trees requires a significant amount of water, which can pose challenges in terms of water management.	**Local and Tourist Market:** A strong local demand, bolstered by the growing tourism industry that seeks authentic and local products. **Exports:** Morocco is one of the major fig producers, with significant export potential, especially to Europe.
Threats	**Opportunities**
Climate Change: Potential impact of climate change on rainfall patterns and temperatures, affecting fig crops. **International Competition:** Market pressure from major players like Turkey and Algeria. Tariff Barriers and Sanitary Standards: Difficulties in accessing certain international markets due to trade barriers and strict standards. **Land Pressure:** Risk of converting agricultural land for non-agricultural uses due to urbanization or tourism development. **International Regulations:** Constantly evolving international trade regulations can pose challenges for the export of Moroccan figs. **Insect Pests:** • Fig moth and psyllid: These insects attack leaves and young shoots, potentially causing significant damage. • Fig fly: In some years, it can reduce production by up to 60 to 70% by causing the fruits to drop. **Diseases:** • Fig scale: It develops on the bark, leaves, and fruits, secreting a waxy white-pinkish substance. Sooty mold then develops on the trees as a result of these attacks. • Cactus scale: This threat also affects prickly pears, reducing their availability in the local market.	**Product diversification:** In addition to fresh figs, the sector can explore the production of derivative products such as jams, fig pastes, and cosmetic products based on fig extracts. **Sustainable development:** The fig tree offers opportunities for more environmentally friendly agriculture, by valuing semi-arid lands and improving drying techniques. **Exports:** Morocco can capitalize on the growing demand for dried figs internationally, by exploring new markets and commercial partnerships. **Increase in global demand:** There is a growing need for organic and natural products, and figs are perceived as a healthy option. **Development of the organic sector:** Potential to convert farms to organic agriculture, adding value in the market. **International partnerships:** Establishing partnerships with other countries for the export of figs can help access new markets. **Agricultural Innovations:** Potential adoption of new agricultural techniques and water-saving irrigation systems. **Agrotourism:** Possible development of agrotourism around fig orchards, adding a source of income. **Government and International Support:** Access to grants and technical support programs.

7.1.2 Sustainability assessment

Direct sales are the most environmentally friendly method of distribution; however, wholesale and cooperative distribution are other options for Moroccan figs.

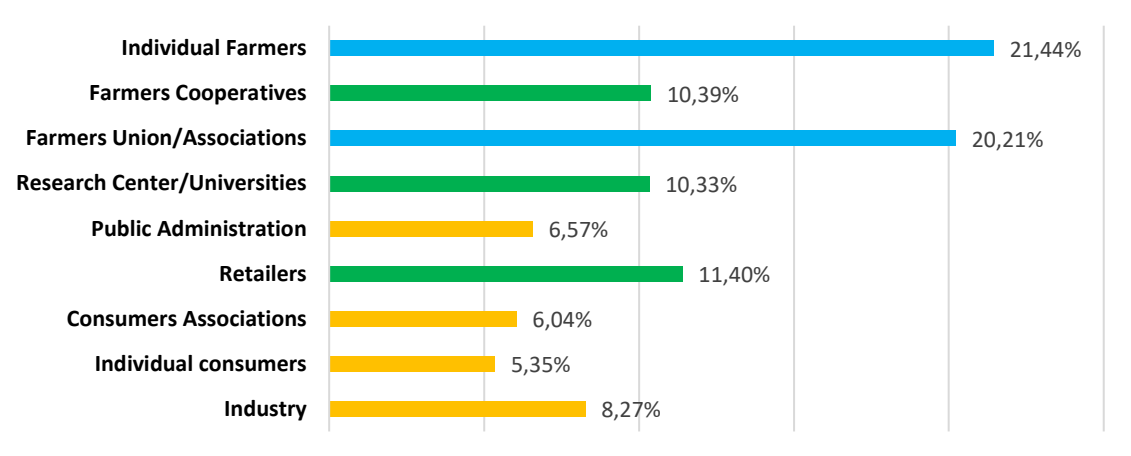
Figure 31. Sustainability of Moroccan fig distribution channels



7.2 Stakeholder mapping and selection

The Moroccan fig production and marketing system was comprised of nine stakeholders. The following figure highlights the importance of each group, of which two were major, three were medium, and four were moderate in importance for this mapping.

Figure 32. Global priorities by stakeholders' type in the Moroccan Fig supply chain



7.3 Living Lab main activities

7.3.1 Focus groups

FOCUS GROUP 1 (07/03/2023)

P1. President of Jnan rif cooperative and farmer
P2. Industry
P3. Farmer
P4. Farmer
P5. Farmer
P6. Industry
P7. Responsible cooperative
P8. Scientific Researcher
P9. Scientific Researcher
P10. Scientific Researcher
P11. Scientific Researcher
P12. Scientific Researcher

During the Focus Group session, the following needs and drivers were identified:

- Irrigation and water saving techniques
- Methods of maintenance and increase in yield
- Marketing problems outside Ouezzane and abroad
- Lack of continuing training in new sales and marketing methods
- Limitation of Ouezzane fig supply chains
- Need certificates to promote and make known the Ouezzane fig as "IGP"

Figure 33. First Focus group on the fig value chain at Ouezzane (North Morocco)

7.3.2 Workshops

Workshop	Living Lab	Thematic
Fig Production and Commercialization	Fig LL Morocco	Hassan Ouabouch (economist and value chain expert) Kaoutar El fazazi (specialist and expert in quality and technological development of agricultural products) Predicted date: 15/07/2024 Participants……stakeholders Workshop in situ

7.4 Main outcomes

The main objective of the Fig Living Lab in Morocco was to increase fig production in Ouezzane and diversify marketing markets. In addition, the aim was to improve fig cultivation practices and to achieve fig valorization to generate more added value in the value chain.

The activities focused on providing fig producers with tools to improve the conditions for growing, distributing, and selling their product. The implementation time of the workshops and capsules allowed for continuous training of the farmers. These training activities were aimed at fig producers in the Ouezzane region, especially on agronomic aspects on the one hand and production and marketing on the other.

To carry out these activities, the collaboration of the Jnan Rif cooperative and other cooperatives and associations to exchange experiences in the production and marketing of figs in local, national and international markets was essential.

However, it is important to point out some risks. The main risk we faced was the availability of farmers to attend the workshops, as it is difficult to convince them at the beginning and to involve them in order to create a climate of exchange on the different problems and difficulties.

Despite the differences of interests that are sometimes observed between some actors, the problem was quickly overcome and the attendees (farmers, cooperatives, public administration, etc.) agreed on the rest of the points discussed.

8 Goat Living Lab in Algeria

Living Lab meeting point:
National Higher Agronomic School (El Harrach, Algiers)

Goat Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/algerian-goat-living-lab/

8.1 Context analysis

The goat supply chain in Algeria is characterized by the predominance of the informal economy, with an absence of contractual relations between actors. The value chain is made up of breeders, collectors, transformers, retailers and consumers. There are also supervisory institutions, such as the Ministry of Agriculture an its decentralized structures, chambers of agriculture, technical institutes, Training centers, research centers, Universities, banks, etc.

There are imported breeds (Saanen, Alpine, Maltaise et Poitevine) and local breeds (Arabia et Makatia, Kabyle and M'zab).

8.1.1 SWOT analysis

An analysis of the development of the goat's milk sector over time raises a number of questions. While it has benefited from some investment under public policies, its growth rate remains very modest, particularly in the production and collection segments.

The problems encountered in the production segment are :

- The country's semi-arid to arid climate and insufficient water resources prevent abundant production of green grass and fodder.
- Farm typology, with a majority of small farms.
- The shortage and high cost of certain inputs, notably leguminous forage seeds.

The factors that have limited collection are attributed to the lack of :

- milking and milk storage equipment.
- collection routes in difficult-to-access areas.

The problems encountered in the processing segment are linked to weaknesses in :

- Administration of pasteurized and raw milk prices.

- Inadequate organization of collection networks (the circuit) in line with production basins and around processing units.

Initial survey results have enabled us to identify the following factors favoring the development of the goat dairy industry:

- Encouraging the work of rural women, who play a crucial role in overall success;
- Public policy efforts to develop goat's milk production ;
- Raising consumer awareness of the nutritional value of goat's milk ;
- Encouragement of small-scale processing of goat's milk into cheese by farmers;
- Development of communications to publicize the product through the use of NICTs;
- Encouraging breeders to form cooperatives and associations;
- Strengthening the marketing component to ensure product availability at the right time and in the right place;
- Investment promotion for the creation of processing units;
- Reducing production costs by subsidizing inputs while waiting reindustrialization.

Weaknesses	**Strengths**
-Truncated and poorly structured value chain. -Lack of processing factories interested in milk and goat meat. -Low women – implication, who could play an important role in goat value chain (production an processing).	-Large young rural population. -Impressive number of goat farms. -Goat fresh milk and meat its by-products are well appreciated by consumers. -Breeders have enough experience in goat farming. -A dense road network to ensure collection and distribution under the best possible conditions.
Threats	**Opportunities**
-The local genetic diversity is threatened be cause of the introduction of exotic breeds. -Dependance on rainfall for irrigation of areas used to produce fodder crops. -The shortage and the high price of Livestock feed.	-Strong demand for goat’s milk, milk and cheese : -Gouvernment interest in the development of the goat industry in Algerie.

8.2 Stakeholder mapping

The selected stakeholders to form the Living Lab were:

-Wilaya Chamber of Agriculture;

-Technica Agricultural Training Institute;

-Goat association

-Dairy Cattle Association

-Association Interprofessionnal Concil of the milk sector

-Association of growers of the commune Beni Maouche.

8.3 Living Lab main activities

8.3.1 Focus groups

The participants of the focus group were:

P1. Technical Institute of Livestock
P2. Interprofessional Council of the goat industry in the Wilaya of Tizi - Ouzou
P3. Economic Observatory of the Technical Institute of Livestock
P4. Research professor at the Applied Economics Research Center.
P5. Teacher at the University of Tizi Ouzou.
P6. Doctoral student at ENSA.
P7. Multipurpose Agricultural Cooperative of Tizi Ouzou
P8. Agricultural Cooperative of the Milk Sector (COAFL) “Thirga Ouelah”
P9. Management Board of COAFL
P10. Management Board of COAFL
P11. Directorate of Agricultural Services of the Wilaya of Tizi - Ouzou.
P12. Directorate of Agricultural Services of the Wilaya of Tizi - Ouzou.
P13. Lecturer at ENSA.
P14. Lecturer at ENSA.
P15. Lecturer at ENSA.
P16. Master’s student at ENSA,
P17. Technical Institute of Livestock

The points raised during the first workshop were:

- The goat sector is very marginal compared to other animal sectors (cattle, sheep, poultry).
- The vast majority of breeders have a small number of goats
- The extensive livestock system is the most dominant.
- The existing breeds are geographically distributed in the eastern (Arabia), central (Kabylie dwarf, M'zab) and western regions.

- We raise the problem of food which significantly increases the cost of production.
- Milk production is low and does not exceed 1.5 liters/day/goat.
- n Tizi-ouzou and Ghardaia, The collection is formal
- The milk is sold entirely to processing industries.
- A small part of milk production is intended for self-consumption
- The choice of processing industry is generally based on two criteria: The purchase price per liter of milk and the breeder-collector relationship.
- Collectors are considered employers of the processing unit
- In general, the consumption of goat's milk is encouraged for its virtues. Consumers buy raw milk directly from farmers on farms. Milk is packaged in plastic bags or bottles, without quality control or labeling. There is no traceability (informal sale)

Figure 34. Goat Living Lab in Algeria

In conclusion, it emerges from the 2 workshops organized at ENSA and the Tizi - Ouzou Chamber of Agriculture that:

- The State must continue to help the goat sectors

- There is a need to create the conditions for organizing stakeholders in the fig and goat sectors around a national association and a representative inter-professional group

8.3.2 Workshops

Workshop	Living Lab	Thematic
Goat sector in Algeria	Algerian Goat LL	- The goat sector is very marginal compared to other animal sectors (cattle, sheep, poultry). - The vast majority of breeders have a small number of goats - The extensive livestock system is the most dominant. - The existing breeds are geographically distributed in the eastern (Arabia), central (Kabylie dwarf, M'zab) and western regions.
Yield and price of goat sector	Algerian Goat LL	Milk production is low and does not exceed 1.5 liters/day/goat. - Increasingly, goat breeders sell milk to processing units - The average selling price is 110 DA/liter. The maximum is 200 DA / liter. - The price of goat meat varies between 1200 and 1300 DA, close to that of sheep. - The public policies undertaken during the 1980s are not continued. -It is necessary to mobilize stakeholders in the value chain to defend their interests. -Organization of a day on the goat industry.

8.4 Main outcomes

From the results of the two participatory workshops carried out, it emerges the need to continue to work with certain influential members of the fig and goat value chains in order to participate in the consolidation of the database created. The analyzes will serve as decision support tools.

MAIN INPUTS OR CONTRIBUTIONS OF THE LL
The main contributions to the Algerian partner's project are: -The determination of prices of fig and goat milk in Algeria. -Consumption survey in Algeria which was the subject of a comparative study of the consumption of figs in some Mediterranean countries by the Greek partner. -Participation in the fig festival in France. -transmission of information on Algeria to feed the site concerning the fig route. -Mapping of fig and goat value chains. Carrying out two focus groups to deepen the analysis on the fig and goat value chains. and come out with proposals.

PROBLEMS IDENTIFIED BY THE LL
The main constraints facing the project are: -Bureaucratic management by budget administration (20% budget consumption only) Insufficient budget Difficulty of access to information (Retention of information at the level of administration and informal economy).

FUTURE LINES OF ACTION PROPOSED BY THE LL
The prospects are: Creation of a network made up of influential actors to develop the fig and goat value chains. Defense of a doctoral thesis by Ms BAROUK Khadidja (Member of the LAB4SUPPLY project).

9 Fig Living Lab in Algeria

Living Lab meeting point:
University Mouloud MAMMERI of Tizi Ouzou

Mediterranean Fig Living Lab space in LAB4SUPPLY's website:
https://www.lab4supply.eu/platforms-fig/

9.1 Context analysis

As in the goat supply chain, there is a predominance of the informal economy. Despite its opportunities for development and revitalization, fig tree cultivation in Algeria is still an activity of secondary interest and is subject to intense anthropic pressure (urbanization, forest fires, etc.), cultural management and ageing of the plants. Fig trees are also plagued by increased and recurring problems of phenology, confusion in their names and genetic vulnerability.

Given this situation, developing the fig value chain is one of Algeria's strategic objectives in the fight against food insecurity and malnutrition, the productivity of agricultural activity and the diversification of the national economy.

This opportunity to add value to production requires performance at every link in the chain to facilitate marketing, the development of agri-food industries and, eventually, exports.

9.1.1 SWOT analysis

9.2 Stakeholder mapping

The players involved in the fig value chain in the study regions are production support institutions, agri-suppliers, producers and distributors of fig products.

The selected stakeholders to take part in the living lab were:

-Agricultural Chamber of the Wilaya of Tizi Ouzou

-Directorate of Agricultural Services of the Wilaya of Tizi - Ouzou.

- University of Tizi Ouzou.

- Fig Association of growers of the commune Beni Maouche (Bejaia).

9.3 Living Lab main activities

9.3.1 Focus groups

The points raised during the second workshop were:

- Fig tree cultivation dates back to the colonial period.

o In 1930: Celebration of fig day in Sidi Aiche (Wilaya of Bejaia).

o In 1949: Organization of the fig congress on September 3, 4 and 5 in Bejaia.

- The main varieties of fig are: Illoul, Abtroun, Amellal, Tit-En, Tsecourt,...

- The production of figs is relatively low if we consider the potential of the country and in view of the hardiness of the fig tree. Thus, despite successive reforms over the past 50 years, Algerian fruit production cannot meet demand, whether for fresh produce or processing. This low productivity is attributable to climatic conditions, the lack of good mechanization and the very marked disorganization of the sector.

- Presence of a pest which risks causing serious damage to the fig orchard.

- The fig sector, with all its resulting value chains (fresh fig value chain, dried fig value chains, fig jam value chain, etc., etc.) remains an example to study using a practical approach to identification, promotion of agricultural and agri-food value chains.

Figure 35. Fig focus group in Algeria

9.3.2 Workshops

Workshop	Living Lab	Thematic
Practice of fig cultivation	Algerian Fig LL	- The practice of fig cultivation goes back further in the Kabylie region - The fig tree is part of the family tradition and is strongly anchored socially and culturally. - Mountain fig farming is essentially based on traditional arboriculture of an extensive and family type and made up of old orchards. - In these ecosystems, land, mainly family-owned, is marked by joint ownership and fragmentation which slows down farm investments
Evolution of fig cultivation	Algerian Fig LL	The production of figs is relatively low if we consider the potential of the country and in view of the hardiness of the fig tree. Thus, despite successive reforms over the past 50 years, Algerian fruit production cannot meet demand, whether for fresh produce or processing. This low productivity is attributable to climatic conditions, the lack of good mechanization and the very marked disorganization of the sector.

9.4 Main outcomes

From the results of the two participatory workshops carried out, it emerges the need to continue to work with certain influential members of the fig and goat value chains in order to participate in the consolidation of the database created. The analyzes will serve as decision support tools.

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10 Contribution of the Living Labs to the Sustainable Development Goals

In summary, the LAB4SUPPLY project has worked to improve the sustainability of agri-food chains together with stakeholders within the framework of each Living Lab. The results, although they depended on the context of each chain, can be summarized in a contribution to the key SDGs, as shown in the following tables.

Goal 2. Zero hunger	
Target	LAB4SUPPLY contribution
2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	Identifying market opportunities offered by alternative distribution channels to small producers is a crucial aspect of enhancing their economic benefits and negotiating power. Alternative distribution channels, such as direct-to-consumer sales, online platforms, and local markets, present numerous advantages for small-scale producers. By bypassing traditional intermediaries, small producers can capture a greater share of the final sale price, thereby increasing their profit margins. This direct engagement with consumers not only enhances revenue but also enables producers to build stronger relationships with their customer base, fostering brand loyalty and repeat business.
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and	Small-scale agriculture has proven to be more resilient to climate change and market fluctuations due to its diversified crop production and traditional knowledge. This adaptability ensures more stable and sustainable production. Additionally, it fosters synergies and horizontal cooperation among producers, strengthening relationships with other

that progressively improve land and soil quality.	supply chain stakeholders. This cooperative approach enhances resource sharing, collective bargaining power, and market presence, leading to increased economic benefits and a more robust agricultural sector.
2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.	Small-scale agriculture preserves the greatest number of crop varieties, primarily local ones. These varieties are not only well-adapted to the local natural environment but are also deeply connected to the region's cuisine and cultural identity. This project identified the importance of preserving these varieties due to their significant social and environmental impact and the economic opportunities they represent.
2.C Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.	The price study conducted allowed for the observation of how both ends of the supply chain—producers and consumers—respond to price variations. With this information, policymakers can develop strategies to minimise the negative impacts of price fluctuations. Additionally, these strategies can address the needs of small producers who are often unprotected and disadvantaged in the global market.

Goal 5. Gender Equality	
Target	LAB4SUPPLY contribution
5.1 End all forms of discrimination against all women and girls everywhere	The project has demonstrated the significant role women play in small-scale production. Women are not only landholders or labourers in agriculture but also play a fundamental role in the distribution and marketing of their products. In many cases, they are directly responsible for selling the majority of the

	production, using traditional channels such as sales at itinerant markets or managing direct sales.
5.B Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	Training small producers in the use of technology for their agricultural activities is crucial. Equally important is ensuring access for women, who often manage financial tracking, sales, and payments to suppliers. This dual focus on technological empowerment and gender inclusion can enhance productivity and economic outcomes for small-scale agricultural enterprises.

Goal 8. Decent work and economic growth	
Target	LAB4SUPPLY contribution
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	Economic development is key not only to achieving sustainability but also to preserving family or small-scale agricultural production. This type of agriculture has proven to preserve biodiversity and uphold social and cultural values, yet it consistently receives the lowest income. Therefore, it is essential to strengthen their market strategies to ensure that their earnings are proportional to their crucial role in the productive chain.
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services	In recent years, there has been a shift in public policy to consider small producers. However, these efforts remain insufficient. Legislation must be enacted to protect traditional agriculture and local varieties, and to promote legal frameworks that defend small producers, rather than confining them to a high-scale production model or treating them as independent workers. The social role of these agents is significant, as demonstrated during the recent

	pandemic, when they provided fresh, quality food to households worldwide.
8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead	Small-scale agriculture often employs low or zero environmental impact agricultural techniques, utilizing natural resources conscientiously and respecting the productive capacities of each crop variety. It avoids intensive production or overproduction and eschews monoculture practices. This type of agriculture offers a wide range of products distinguished by diverse colours and flavours.
8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	One of the main challenges facing agriculture is generational succession, where young people show limited motivation to enter the agricultural sector. According to research, this reluctance stems from two primary factors: the scarcity of available land and the comparatively low economic return relative to the time and resources invested.

Goal 9. Industry, innovation and infrastructure	
Target	LAB4SUPPLY contribution
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	The project identified the transformation sector (industry and HORECA) as a significant ally for small-scale producers, particularly local enterprises and establishments that highlight local or proximity products. These entities recognise the quality of local production and facilitate access to new markets for small producers. Additionally, beyond consumer-facing agricultural recognition, the industry plays a crucial role in transforming products and extending their shelf life.

Goal 10. Reduced inequalities	
Target	LAB4SUPPLY contribution
10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	In recent years, small-scale agriculture has demonstrated openness to welcoming anyone interested in working within the sector. While access to land remains a limitation, the sector actively encourages new farmers to join, regardless of age, gender, race, religion, origin, economic status, or prior professional background. Moreover, there has been observed synergy between retired or older farmers and newcomers. These experienced farmers not only lease their land but also provide mentorship and guidance to new producers, fostering a collaborative and supportive environment within the agricultural community.

Goal 11. Sustainable cities and communities	
Target	LAB4SUPPLY contribution
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	Agricultural spaces are hubs of biological diversity, not only producing food but also providing habitats for essential insects and plant species crucial to life's development. Additionally, the foods produced here promote social cohesion and form the cornerstone of local gastronomy, representing an inseparable part of a community or region's identity and local economic activity.
11.A Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	Small-scale agriculture typically supplies the nearest urban areas, predominantly providing food for urban social movements such as food baskets, organic production, and, more recently, proximity sales. These synergies are linking rural and urban sectors, where rural agriculture is gaining greater

	prominence and urban areas are recognizing the importance of rural production.

Goal 12. Responsible consumption and production	
Target	LAB4SUPPLY contribution
12.2 By 2030, achieve the sustainable management and efficient use of natural resources	Small-scale agriculture efficiently utilizes natural resources, particularly water. By using locally adapted varieties that are resilient to local weather conditions, these farmers often do not rely on irrigation. Moreover, they have adapted their practices to suit soil characteristics, maximizing productivity even on less agriculturally productive soils. This type of agriculture exemplifies sustainable practices by making optimal use of natural resources and adapting to local conditions.
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	Diversifying sales channels in small-scale agriculture is a tool that minimizes food waste. Produce that does not meet the standards of large distributors or wholesalers finds outlets in retail markets supported by social movements, through food donation channels, or by undergoing transformation processes. This approach ensures that agricultural goods reach consumers or serve beneficial purposes rather than being wasted due to aesthetic or size standards set by larger distribution systems.
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	In some countries within the LAB4SUPPLY consortium, small-scale agriculture has been observed to occupy a crucial space and preference in school canteens. These establishments prioritize purchasing a larger volume of fresh produce over processed foods, with a preference for seasonal and locally

	sourced items. This emphasis not only supports local small-scale farmers but also promotes healthier dietary choices for schoolchildren, aligning with goals of sustainability and community support within the educational sector.
12.A Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	LAB4SUPPLY has facilitated the exchange of experiences and synergies among countries in the Mediterranean basin. The diversity of participating countries, along with their national, European, and non-community policies, has fostered an exchange that brings substantial benefits and collaborative efforts towards a more sustainable food distribution system.

Goal 13. Climate action	
Target	LAB4SUPPLY contribution
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Traditional agriculture has demonstrated minimal reliance on technology and intensive production systems, emphasizing responsible use of land and water resources. It sustains the livelihoods of the majority of rural residents. Promoting and valorizing this type of agriculture will contribute to its preservation and extend the positive impacts it generates through an integrated and sustainable system of production, distribution, and consumption.
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains	One objective of this project was to identify weaknesses among small-scale producers, particularly in production and trade, and address them through training capsules. These capsules provide key tools that farmers can implement in their operations without significant time investment in training. As a result, various instructional video capsules and

and drylands, in line with obligations under international agreements	workshops on topics of interest to farmers have been developed as part of this initiative.

Goal 15. Life on land	
Target	LAB4SUPPLY contribution
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	Traditional agriculture serves two primary objectives: firstly, preserving locally adapted crop varieties suited to the area's soil and climate conditions, and secondly, providing protection to biodiversity by safeguarding insects, birds, and microorganisms essential for the proper functioning of the local habitat. This dual focus supports sustainable agricultural practices that maintain ecological balance and enhance agricultural resilience.
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	Traditional agriculture not only has environmental impacts but also serves as a means to preserve landscapes and generate cultural heritage. It is of significant interest to local and national authorities for its preservation due to its links with rural tourism, gastronomy, and the revitalization of rural areas. This connection highlights its role beyond food production, contributing to broader socio-economic benefits and sustainable development initiatives in rural communities.

Goal 17. Partnership for the goals	
Target	LAB4SUPPLY contribution
17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to	The implementation of Living Labs in various case studies served to create an ecosystem of cooperation among stakeholders in the chain, where the participation of local authorities,

support the achievement of the sustainable development goals in all countries, in particular developing countries	academia, and consumers was crucial. Working collaboratively, these groups sought options that would benefit the majority. All voices were heard, and in most cases, agreements were reached through the empathy of those involved.
17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	