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**Co-creating sustainable and competitive FRuits and vEgetableS’**

**value cHains in Europe**

**Deliverable 7.2**

**Policy Brief**

**Responsible partner: UGent**

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Table 1: History of changes

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# Abbreviations and Acronyms

|  |  |
| --- | --- |
| Abbreviation / Acronym | Description |
| AKIS | Agricultural Knowledge and Innovation Systems |
| BEC | Bioeconomy Cluster |
| CAP | Common Agricultural Policy |
| DG-AGRI | Directorate-General for Agriculture and Rural Development |
| EIP-AGRI | European Innovation Partnership for Agricultural Productivity and  Sustainability |
| EU | European Union |
| H2020 | Horizon 2020 |
| HE | Horizon Europe |
| KIS | Kislépték |
| MS | Member State |
| OG | Operational Group |
| PC | Pilot Case |
| PCWG | Pilot Case Working Group |
| R&D | Research and development |
| SOI | Sustainable Oriented Innovation |
| SWG SCAR | Strategic Working Group of the Standing Committee on Agricultural Research |
| TRL | Technology Readiness Levels |
| UGent | University of Gent |
| UNIBO | University of Bologna |
| WG | Working Group |
| WP | Work Package |
| WU | Wageningen University |

# Executive Summary

Commencing with the overarching aim of Work Package 7 (WP7) – "Maximizing impact across Europe through wide dissemination of project results and networking activities, in collaboration with other projects under topics RUR-06-2020 and RUR-07-2020" – and culminating with specific objectives, this document centres on Task 7.3, with a detailed focus on the forthcoming policy brief (chapter 5.1). Building upon the insights from Deliverable 1.5, "Impact of public policies on sustainable innovation in agri-food chains" generated in WP1, Task 7.3 has actively participated in meetings with the Strategic Working Group (SWG) SCAR-Food Systems and SWG SCAR-Agriculture and Knowledge Innovation Systems (AKIS) to produce a joint policy brief. This brief addresses the challenges and solutions related to sustainability in the agri-food chain, considering climate conditions, dwindling natural resources, power imbalances, changing demographics, and dietary habits. It is co-created with the sister projects funded under the Horizon 20202 call topics RUR-06 and RUR-07. Key issues and recommendations were discussed by participating and presenting in joint workshops (3 physical and 2 online) organised by the sister projects, and 5 quarterly meetings of the WG on Policy Briefs.

This deliverable serves as a comprehensive guide, offering explicit recommendations to policymakers on enhancing innovation within the value chain. Focused on the co-creation process, it meticulously identifies key barriers. The primary aim is to raise awareness and advocate for innovative solutions originating from the examined value chain cases. Tailored for policymakers and funding agencies at European, national, and regional levels, this brief provides valuable insights to promote and ensure sustainability-oriented innovation in the fruit and vegetable production chain.

**Key Challenges Identified:**

**Financial Realities**: Insufficient funding hampers infrastructure development, escalating costs, and diverts attention from sustainability concerns.

**Human Resources**: Workforce shortages, collaboration gaps, and misalignment with consumer interests impede sustainability efforts within the value chain.

**Knowledge Gap**: Influenced by neoliberalism and lacking comprehensive policies, knowledge enhancement within and beyond value chains is hindered.

**Power Imbalances**: The dominance of large corporations exacerbates environmental impacts, underscoring the need for shared goals and robust regulation.

**Coordination issues**: Sustainability-oriented innovation requires action from many different stakeholders, who all need to align their decisions, investment choices, and risk behaviour. Coordination by the market does not work in situations of high uncertainty; governments could take a leading role in not only providing clear regulation but also in helping businesses surpass the first hurdle of investment in uncertain markets.

In response to these challenges, this policy brief proposes a holistic strategy that integrates various dimensions of innovation. By addressing financial constraints, enhancing collaboration, prioritizing knowledge dissemination, and regulating power dynamics, the strategy aims to foster innovation that is economically viable, socially responsible, and environmentally sustainable.

# Introduction

Starting from D 1.5 "Impact of public policies on sustainable innovation in agri-food chains” produced in WP1, Task 7.3 engaged in the SWG SCAR-Food Systems and SWG SCAR-AKIS meetings (4) to produce, in cooperation with other selected sister projects under topic RUR-06 and RUR-07[[1]](#footnote-1), (FAIRCHAIN, PLOUTOS, LOWINFOOD and FOODRUS) a **Joint policy brief on the challenges and solutions to sustainability aspects in the agrifood chain linked to climate conditions (e.g., water, emissions), deteriorating natural resources, increasing power imbalances in the agri-food value chain, changing demographics, and dietary habits.**

From D 1.5 we learn that little is still explored regarding the impact of public policies on agri-food chains as a whole. Public policies at regional levels can play a forefront role in the sustainability of the agri-food sector to ensure reduced pressure on natural resources and good living conditions in rural areas, by creating an enabling environment for the introduction of innovation along the whole agri-food chain. On the other hand, the first outcome of the study is that very few studies thoroughly addressed the role played by public policies in orienting agri-food value chains toward sustainability. Although financial policy instruments were acknowledged, in general, as the most important ones for promoting the implementation of sustainable innovation, stakeholders recognised **educational and informative instruments** as the most specifically suitable for improving the social dimension of sustainability of value chains. Stakeholder demand for public policy is increasingly about the ability to facilitate the implementation of innovation among family firms, small enterprises and, more generally, SMEs.

Based on the above, the following report aims to address a set of policy recommendations, briefly, to decision-makers at two levels: regional/national (depending on the size and structure of the country) and EU level. These will focus on Food Systems, in particular in the fruit and vegetables sector, and will touch upon aspects of food systems legislation, and its balance between economic – environmental – social sustainability. The policy brief reflects on the identified internal and external factors that may hinder the socio-economic context of the sector (agri-food value chains) based on the experiences of the pilot cases during the implementation of the project innovations and several workshops held by experts from the project partners.

# Methodology

The policy brief was developed through consultations (3 workshop sessions) with Task partners and sister projects; 2 national workshops, 2 interviews with pilot case partners, and 3 feedback sessions from the SWG SCAR- Food Systems, SWG SCAR-AKIS, EIP-AGRI key actors (value chain stakeholders), and experts (value chain advisors).

## 3.1 Consultation with sister projects

Consultations (workshop sessions) with the task partners (including pilot cases), sister projects feedback, and input from the SWG SCAR FOOD System, SWG SCAR-AKIS and EIP-AGRI key actors and experts were organised by the WP leader. The consultations were based on the initial recommendations provided by the partners (UNIBO, WU, BEC, KIS) of CO-FRESH Task 7.3. They stemmed from several brainstorming meetings (both online and physical) and questionnaires (conducted via Mentimeter) with the pilot cases and the rest of the project partners during the annual project meetings. The purpose of these consultations was to learn from the pilot cases, understand their needs, and identify the main bottlenecks encountered during the process of selecting and implementing innovations.

## 3.2 National workshop and SCAR AKIS meeting presentations

In addition to the feedback and results from the national workshops held in Budapest, Hungary (organized by KIS) and Nitra, Slovakia (organized by BEC), the topic was presented at the 2nd meeting of the SWG SCAR-AKIS, under the 6th mandate, held in Prague on 12-13 April 2023. Additionally, a preliminary presentation was conducted with the policy officers from the EC and project partners involved in the task, which took place in Brussels on 26th October 2023.

* The meetings focused on discussing the scope, the target audience (national/regional policymakers, national/regional retailers, farmers' associations and cooperatives, trade consortia, etc.), the structure, the elements we want to showcase and the dissemination and validation channels. Such as "What should policymakers do to improve the outreach of the projects?"
* The Mentimeter survey of the pilot cases and other partners (pilot case working group) of the project aimed to identify internal and external driving forces of the evolving socio-economic context of the sector identified in their case, or related sector by citing the internal and external factors that may **hinder Sustainability-oriented innovation (SOI)** in agri-food value chains, and citing internal and external factors that may **enable SOI** in agri-food value chains.
* The national workshops, Budapest, 07/05/2022 “Cross-exchange workshop with stakeholders of innovation projects” and Nitra, 17/08/2023, (agenda in annexe) “Transfer of knowledge from international projects to the strengthening of agricultural policy”, had as their respective objectives:

1. To get together partners participating in Horizon 2020 funded projects related to the food chain and the AKIS to create an informal network and knowledge exchange platform, that contributes to promoting the use of innovative good practices, methodologies and results created in projects and engaging end users more effectively.
2. To discuss between Horizon funded projects focused on agri-food and the bioeconomy and relevant policymakers, on how to integrate the results of these projects into future agricultural policy.

Participants at the workshops were split up into 4-5 groups of approximately 10 participants to discuss the **16** recommendations and a rotation was made (carousel) so that each group had the opportunity to give comments and inputs on each recommendation. Policymakers of at least 19 MS (**Croatia, The Netherlands, France, Italy, Slovakia, Belgium, Germany, Ireland, Poland, Finland, Hungary, Czechia, Estonia, Bulgaria, Lithuania, Greece, Austria, Spain, and Portugal**) were present, who gave their opinion and brought key messages to their MS and their networks.

Sister project (FAIRCHAIN, PLOUTOS, LOWINFOOD, and FOODRUS) partners had the opportunity to review and rank the recommendations according to their importance and relevance to the subject, which ultimately resulted in a common top recommendation to be discussed and further elaborated upon in the final working group meeting (6 meetings in total). Subsequently, the results of the workshop were validated with the sister projects and the recommendations (for the final report of WP7) were collected from the MS representations in those workshops (including cross-visits to pilot cases).

The **16** recommendations were then regrouped into small (**8**) main recommendations as a basis for a Policy Brief. Recommendations from the Policy Brief should be presented in the EIP-AGRI Newsletter. As well as presented in national and/or regional meetings.

## 3.3 Policy Interviews with CO-FRESH Pilot Case Partners

The Pilot Cases and their Support Partners gained several experiences during their co-creation process from the planning session until the implementation. The WP task managers and KIS decided to collect these experiences regarding the main driving forces and barriers which are linked to certain European, national legislations and policies. That is why PC leaders and Support Partners were invited to online interviews. The main purpose of the interviews was to review all the planned and implemented SOI during the co-creation process (WP2 and WP3) to recognize those policies that mean inspiring and hindering factors.

The innovations, the whole process, and the results were analysed through three questions:

1. While you were working on your innovation, did you meet any legal obstacles to developing and implementing the findings or results?
2. Did you find any difficulty in implementing any identified innovation solution from a legal, economic or environmental perspective?
3. Did you succeed in marketing the innovation developed during the project or do you have any obstacles? Or just the opposite: did you have such a regulatory environment which was working as a driving factor for the utilisation of the results of the pilot?

KIS, as a support partner for PC6/Pilze, participated in WP2, WP3 and the Pilot Case trainings therefore, the whole process, the questions, and the issues which were raised during the project implementation were taken into account. Before the Pilot Case interviews all the SOIs and the previously planned SOI were examined to be able to explore those hindering factors which determined the implementation process.

# Results

## 4.1 Outcomes from Pilot Cases and Pilot Cases Working Groups’ survey answers

In the context of our overarching framework, following comprehensive discussions and presentations by leaders of the WPs and pilot cases in the (re)design and piloting of European agri-food value chains, we have reached a converged on a holistic and innovative approach. The key objective is to drive innovation that enhances the economic, social, and environmental sustainability of these value chains. This will be achieved through the intelligent integration of technological, social, organizational, managerial, and institutional innovations.

The principal insights into the question of **identifying internal and external factors that may hinder Sustainability-Oriented Innovation (SOI) in agri-food value chains** can be summarized as follows:

In the financial realm, the lack of sufficient funding can lead to inadequate infrastructure to implement innovation, resulting in protracted returns on investment or no investment at all. Farmers and processors often find themselves more preoccupied with the cost of goods than with sustainability, contending with crisis factors, escalating energy expenditures, and the burdensome expenses of innovation. With downstream supply chain actors mainly focussing on cost (to attract consumers to the store), SOIs do not materialize as they, in the short term, often imply higher costs.

Turning to the human and organizational resources aspect, a lack of collaboration among value chain actors arises from workforce shortages, disinterest from stakeholders, a deficit of trust, and a reluctance to cooperate. The misalignment between consumer interests and expectations also contributes to this disconnect. Conflicting interests within the supply chain, along with underprepared operators, exacerbate the challenge.

Internally, it is imperative to enhance knowledge within the value chains, while externally, disseminating knowledge to consumers becomes equally crucial. Unfortunately, this pursuit is hindered by an overoptimistic belief in market forces to solve societal problems and the lack of a comprehensive policy and regulatory framework that prioritizes profit.

Adding to the complexity, large corporations wield significant power. This imbalance is most evident in the pricing of products with a substantial environmental impact, as there exists a noticeable dearth of concrete policies to govern these concerns. The looming spectre of climate change, combined with the unbridled influence of multinational corporations, underscores the urgent need for shared goals and robust regulation.

Policymakers are urged to skilfully craft regulations and standards that prioritize sustainability, protect consumer interests, and simultaneously support the economic vitality of SMEs. This imperative task is underscored by a fundamental knowledge base, ensuring a harmonious balance between effective governance and the flourishing of small and medium-sized enterprises.

Conversely, the circularity assessment may not be attuned to the local context, and marketing campaigns can distort product-related information. Achieving shared goals amid uncertainty about consumer acceptance requires both internal improvements, such as enhanced capabilities and improved communication within value chains, and external measures, such as regulatory changes and an improved economic situation for citizens. Engagement with stakeholders and key actors, including policymakers, is pivotal to navigating these intricacies.

On the other hand, the **principal insights into the question of identifying internal and external factors that may enable SOI in agri-food value chains** can be summarized as follows:

The success of SOI in agri-food value chains hinges on a multifaceted approach. Firstly, adopting a co-creation approach fosters innovation policies that work in synergy with other initiatives, emphasizing the importance of a willingness to change and the continuous monitoring of results. Encouraging farmers, through the work of their advisors, to adopt SOI and establish a transversal strategy that closes the gap between R&D and marketing departments further drives the transfer of research to practical applications. Creating concrete incentives for sustainable resource management systems and fostering better cooperation among value chain actors are essential. Ensuring that technological solutions are ready for application (TRL 8/9) and facilitating targeted knowledge exchange facilitates the process.

Cost savings, increased efficiency, and easier access to credit, along with low investment costs, are pivotal. Leveraging funding opportunities and matching investments with public resources are equally vital, especially given the challenge of low profitability for innovation, exacerbated by economic crises. Supporting environment stakeholders and the contextualization between value chain actors, driven by a growing environmental consciousness, is crucial. The backing of clusters and networking, coupled with better access to technological solutions, is vital. Building confidence in the efficiency of such projects, and drawing inspiration from previous attempts, strengthens the push for SOI.

Regulations, public support, and subsidies for good results are necessary, especially in the context of the Common Agricultural Policy (CAP). External pressures from consumers and society, coupled with calls for transparency, find resonance in the form of independent financial support and the European environmental labelling scheme, backed by EU pressure. It is also essential to ensure a specific space for SOI in rural policies.

Transparency, education, and the effective dissemination of best practices and technologies are vital. Understanding the overall and global benefits of SOI is key, and this is reinforced through policies like mandatory due diligence, financial support, and internalizing the true cost of food. Revising EU trade policies and boosting food public procurement rules further extend the reach of SOIs. This, in turn, is underpinned by the imperative of cultivating a managerial mindset for collaborations and organizational capabilities within, fostering better knowledge within the value chain, and raising consumer awareness externally. Improved communication within value chains, coupled with support from local authorities, ensures that the SOI initiatives can thrive.

## 4.2 Outcomes from National Workshops

4.2.1 Workshop in Hungary for Hungarian sister project partners on networking opportunities and policy

The main objective of the event was to get together Hungarian partners participating in Horizon 2020 projects related to the agri-food chain and AKIS to create an informal network and knowledge exchange platform, which contributes to:

* + getting an introduction about each other’s project;
  + promote the use of innovative good practices, methodologies, and results created in projects;
  + engage end users more effectively.

The subsidiary goal was to invite those Hungarian partners who are partners of the CO-FRESH sister projects and observe together the different collaboration opportunities at the national level to

* + boost the examined value chains/case studies
  + enhance the implementation of project results in the value chains
  + discover the different best practices, and innovative solutions as outputs of the project
  + define commonly accepted recommendations for policy briefs.

The workshop also aimed to provide feedback and recommendations for the D 7.3 policy brief which defines roadmaps for better application, and implementation of innovation models. When the workshop was organised the pilot cases were at the middle stage of their co-creation model which is why the whole process was not presented. However, more Horizon project partners participated who were working on boosting innovation in the agricultural sector and policymakers attended who must implement the AKIS into the national policies. Their opinion and experiences enriched the recommendation of the workshop.

The workshop made the following recommendations:

The EIP-AGRI is actively considering the establishment of policy consortia aimed at aligning research efforts with policy requirements and monitoring. A critical aspect of this approach involves the formation of domestic mirror groups. These mirror groups, comprised of individuals with ministerial experience or backgrounds in institutions with specific commissioned tasks, possess the unique ability to bridge the gap between researchers and policymakers. Their intimate understanding of policy needs and familiarity with both domestic and EU legal systems enable effective communication and interpretation. The groups may as such contribute to better national implementation of the European rules and application of European research results into the national knowledge system. In Hungary, AKIS and soil mirror groups were established.

When planning research initiatives, direct involvement and consultation with policy decision-makers are not only worthwhile but also necessary. Too often, legislators receive policy recommendations that remain unutilized due to the lack of familiarity with legal frameworks. Establishing open communication channels and fostering dialogue between researchers and policymakers is essential. Additionally, to ensure alignment, policy briefs or recommendations should be agreed upon in advance or, at the very least, communicated to the involved parties. That is why ‘mirror groups, Horizon project partners’ meetings are necessary to build national or regional networks linked to concrete topics, and policies.

Moreover, it is prudent to create a dedicated platform for facilitating dialogue, even when the impetus for such communication does not originate from the policy side. This proactive approach fosters a conducive environment for cooperation between researchers and policymakers, ultimately enhancing the effectiveness of research in addressing policy needs.

Several challenges and opportunities arise in the context of European innovation and policy integration. Subtopics, particularly in fields like Food, are often overlooked by Hungarian and Central European experts, leading to the absence of regional needs and perspectives in policy briefs and recommendations. This disconnect can hinder local agricultural innovation.

In value chain-related Horizon projects, a key challenge is engaging potential stakeholders. Many are unfamiliar with research projects and hold negative perceptions of traditional research facilities. Collaborative efforts are recommended to improve stakeholder involvement and dissemination, including the use of new tools like influencers and YouTube channels if cost support from Horizon is available.

For national policymakers and AKIS stakeholders, establishing a common platform and language is essential. Transforming Horizon results into a language that policymakers understand is particularly challenging in Hungary. Efforts in this direction can enhance the acceptance of the European Innovation Partnership (EIP) and other innovation initiatives in the BIOEAST region by policymakers.

4.2.2 Workshop in Slovakia on the transfer of knowledge from international projects to the creation of agricultural policy.

The workshop aimed to present Horizon projects focused on agri-food and bioeconomy and to discuss how to transfer the results of these projects into future agricultural policy. The event brought together key Slovak stakeholders involved in bioeconomy-related projects financed by Horizon 2020 and Horizon Europe, as well as relevant policymakers, mainly from the Ministry of Agriculture and Rural Development of the Slovak Republic.

**CO-FRESH pointed out general recommendations for improvements in national agricultural policy**

Ensuring the real and continuous implementation of long-term strategies, based on insights from the academic and scientific community and validated through practical pilot cases, is a shared goal. We are committed to making project outcomes accessible to all stakeholders in a language understandable to both practitioners and the general public. The influence of these outcomes on policy decisions and their dissemination in influential media channels are top priorities.

To enhance knowledge sharing, stimulate uptake of results, and policy innovation implications, it is crucial to work on an open and user-friendly platform to disseminate project results in which relevant (Slovak) partners are involved. This platform complements the comprehensive economic strategy of the Slovak Republic, encompassing agriculture, currently under development.

Funding instruments available seem to be abundant for innovation, but their more efficient utilization is hindered by factors such as administrative burdens, a lack of innovation understanding, challenges in public procurement, and the absence of coordination in cross-funding efforts. Monitoring and evaluation of the relevant programmes often underestimated in the project cycle, play a crucial role in demonstrating the delivery of milestones, results, and impacts.

Education and training constitute a crucial but long-term component, and awareness-raising and dissemination efforts need to be more targeted and sustained, reaching all relevant stakeholder groups.

The importance of evidence-based and science-backed information, data, studies and best practices for formulating effective policies was highlighted.

Furthermore, it is crucial to actively explore ways to improve the flow of information and data across different ministries and sectors, emphasizing cross-sectoral cooperation.

**CO-FRESH encourages policymakers to learn from EU initiatives and past and ongoing HORIZON projects.**

Active participation of the Ministry of Agriculture and their relevant organisations in European partnerships, spanning areas like agroecology, agriculture data, and food systems, as well as engagement in Horizon Europe projects such as ModernAKIS and BIOEASTsUP, exemplify our commitment to mutual support among Slovak partners in European projects.

The **Roadmap for Circular Bioeconomy,** which is closely tied to BIOEAST initiative and projects like BIOEASTsUP, CEE2ACT, and BOOST4BIOEAST, is a good example of creating synergies between EU initiatives /projects and national policy development.

**CO-FRESH helps to improve national AKIS**

There are notable omissions in the current policy landscape (CAP SP) in Slovakia mainly within AKIS. The desire for effective coordination and management of AKIS and the CAP Network is clear, serving as instruments for advancing innovation, advisory services, and agricultural education. At the national level, the AKIS Steering Committee plays a pivotal role, supported by regional innovation consultancy centres (RIZPI). Interactive discussions have underscored the need for collaboration with scientific and research organizations and academia on diverse topics, from pest management to sustainable use regulation. Vital advisory services, education and demonstration activities are paramount in convincing farmers to adopt sustainable practices. In the context of AKIS, lifelong learning is championed through the Institute of Education and Counselling for Agriculture (IZPI).

**EIP-AGRI as a tool to encourage policymakers**

The significant role of national/regional policy strengthening is played by EIP-AGRI and its activities (e.g. brokerage events, Focus Groups, seminars and workshops). Through constructive dialogues on soil and water management, initiated by the EIP-AGRI event, **climate change mitigation** is being efficiently addressed and demonstrates the power of participatory policy-making. Notably, the Soil Mission endeavours to rejuvenate Europe's soils and establish 100 Living Labs for the healthy soil-initiated effort of establishing a Soil Living Lab in Slovakia. In this respect, it's essential to emphasize the balance between economic, environmental, and social sustainability and recognize that farmers can be the solution, rather than the problem.

In addition, we recognize the significance of **social agriculture** as an integral part of the CAP Strategic Plan, and it's encouraging to see the link to the EIP-AGRI Focus Group in the realm of social agriculture.

## 4.3 Outcomes from Teamwork Brainstorming

When elaborating on the policy brief, it was crucial to consider specific comments and observations. One prominent issue in Central and Eastern Europe is the gap between national policies and EU policies. EU policies often remain inadequately studied, understood, and implemented by national and regional policymakers, resulting in **limited to no utilization of EU policies and instruments** for the benefit of not only citizens within these countries but the entire Europe.

The CO-FRESH project provided several incentives to improve the development and implementation of national/regional agricultural policies. Those incentives arose and lessons learnt can be explored from the project´s pilot cases, sister and other HORIZON projects and other cross-cutting activities (e.g. participation in SCAR AKIS).

**Recommendations from CO-FRESH to link CAP SP and other policies including RIS3**

In our endeavours to enhance agriculture and innovation, it is imperative that we strategize, analyze, and address various cross-cutting issues. One pivotal aspect is the **integration of the Common Agricultural Policy Strategic Plan** (CAP SP) **with other policies**, such as the Research and Innovation Strategy for Smart Specialization **(RIS3)** and policies related to science, research, and innovation, particularly concerning European structural and investment funds (ESIF) and the Joint Research Centre's cross-regional cooperation for the S3 platform.

In particular, **voucher schemes** as part of the ESIF should be explicitly acknowledged to support innovation across various sectors including agriculture. Additionally, the European Social Fund should be integrated into discussions on social innovation. Synergies between various programs are pivotal.

In addition to available ESIF national/regional programmes, **macroregional strategies** and their **INTERREG programmes**, including the Danube, Central Europe, Alpine, and others, hold immense relevance, primarily for networking, partnerships and cooperation generating collaborative valuable outcomes, results and impacts.

## 4.4 Interviews with Pilot Cases

**What we learned from PCs**

The current subchapter summarises the main conclusions, recommendations and messages which were explained by PC leaders and support partners. Table 2 concludes the most important driving forces and obstacles which could be shifted to any European or national policies. Further discussion of the points outlined in Table 2 can be found in Annex 2 of the document.

The major part of the recommendations concerns the current CAP Strategic Plans, mainly the EIP-AGRI, AKIS and other collaboration measures which may have a positive effect on the improvement of fruit and vegetable value chains. The other part of the suggestions are linked to organic farming, packaging and nutrition which require a technological approach and evidence-based results for further steps. Surprisingly, only some cases were mentioned where a national or regional strict regulation hampered the intervention of the chosen SOI. They were linked to tax, trade and water management rules.

Table 2: Summary of main driving forces and barriers mentioned by PC stakeholders

|  |  |
| --- | --- |
| **Driving forces** | **Obstacles** |
| * Tackle climate change effects voluntarily * Possibility to understand the value chain, express for market analysis * Consumer openness to sustainable products * Collaboration with research institutes on new recipe development (probiotic, fava bean, oyster mushroom, apple vinegar) * Tax benefit for organic products[[2]](#footnote-2) * For SMEs, the ultimate solution do something new before others do * Advisory service for building up strategic plans/organizational innovation * Facilitators/support partners/innovation brokers are needed to help farmers join new value chains such as the HoReCa sector, direct consumers * Increasing demand for vegan, flexitarian diets, new dietary habits, new food systems, new consumer demands, and social factors have a positive impact on the fruit and vegetable sector, seasonal consumption, local resources * Faba bean innovation can shorten the value chain * Health Strategies provide recommendations to consume more protein plants, fruit and vegetables, but health and agricultural strategies should find more synergies at the national level * The methodology of the co-creation process made it possible for farmers in the cooperative and the different actors of the Label Rouge value chain to communicate, → AKIS and EIP-AGRI would be good instruments to use these kinds of results at the national level * The awareness of re-localisation of food supply demands more local fruit and vegetables which have a positive impact on SMEs, however, value chains are fragmented. * Introducing a “sustainability label” at the EU level could boost innovative implementations to mitigate climate change effects. | * Niche products, or not-so-popular products, not conventional products (clementine, oyster mushroom, fava bean) which require special communication and marketing * For SMEs it is difficult to be part of Horizon projects, it is a random chance to be invited * Retailers determine purchase conditions; producers are hardly able to influence the supply conditions, especially the fresh products are vulnerable * PCs didn’t know their value chain stakeholders before, and projects made it possible to map new chains (e.g.: oyster mushroom HORECA) * Packaging: More PCs examined the organic, eco-friendly solutions for packaging, but there was no strong consumer demand to pay more for environmentally friendly packaging. The other problem is technological: new, analysed types of packaging do not serve food packaging purposes (PILZE, FLORETTE) * “In packaging the driving factors are the legal regulations and the prices” (PILZE). * Public catering requires pre-prepared or pre-processed raw materials; an SME is not able to make such an investment in preparing pre-processed food, to invest in post-harvest technology * New foods and food novelty do not have a significant role in policy agendas but farmers intend to develop new recipes and solutions. Subsidy and tax benefits are hardly available for innovative farmers; it is challenging to inspire the stakeholders to invest. * In the case of CRAPDL introducing 100% local protein feed (which was the original idea for SOI) was not feasible because consumers are not willing to pay the higher costs, consumers are not aware of and not interested in the local feed system and these added costs are not realizable in price. * FLORETTE raised corporate awareness on water footprint, the current legislation does not reinforce the recycling of washing water or reducing wastewater. * The EU should put on its policy agenda to support environmentally conscious companies. Work on sustainability labels on the EU level should be continued. * Online sales is a very developing sector in the fruit and vegetable sector however in some Member States responding national rules are missing. |

# Summary of priority recommendations

A range of policy options aimed at fostering sustainability and innovation in agri-food value chains is summarized in Table 3. These options span various realms, including finance, human resources, knowledge enhancement, power balances, circular economy practices, sustainability-oriented innovation, policy integration, and funding efficiency. The overarching goal is to address current challenges, encourage collaboration, and promote sustainable practices within agri-food value chains.

The main priority recommendations (policy options) in different areas for enhancing sustainability and innovation in agri-food value chains are summarised below:

1. Normative Framework:

* Develop a comprehensive policy and regulatory framework at EU, national and regional levels prioritizing sustainability over profit.
* Establish standards at EU, national and regional levels to govern the pricing of sustainable products.

1. Financial Support:

* The European Commission should create or promote the creation of a dedicated fund at the EU and national levels to support sustainability-oriented innovation in agri-food value chains.
* Align private funding opportunities with public resources to support innovation.

1. Collaboration and Communication:

* Encourage collaboration among value chain actors through transparency and targeted mechanisms and instruments such as collaborative platforms.
* Improve communication within value chains and encourage open channels (e.g. discussion forums, participatory workshops, policy innovation labs, etc.) between researchers and policymakers.

1. Knowledge Dissemination:

* Enhance knowledge sharing (participatory workshops, thematic conferences, use of online platform, etc.) within value chains and prioritize knowledge dissemination to consumers.
* Counteract the influence of over-optimistic belief in market-based solutions.

1. Circular Economy Adoption:

* With the support of specialised advisors, improve internal capabilities and communication within value chains for better adoption of circular practices.
* National and regional authorities should advocate for regulatory changes to support circular practices and improve economic situations for citizens.

1. Incentives for SOI:

* Establish concrete incentives for sustainable resource management systems to encourage SOI.
* Leverage public support and subsidies, especially in the context of the new Common Agricultural Policy (CAP).

1. Policy Integration and Coordination:

* Facilitate coordination and alignment between the CAP Strategic Plan and other relevant policies to address cross-cutting issues by e.g. performing cross-talk of Ministries, enhancing collaboration of ministries at the MS level, etc.
* Establish a straighter link between national policies and EU policies, ensuring effective exploitation of EU policies and instruments.

1. Funding Efficiency and Monitoring:

* Streamline administrative processes and enhance coordination for more efficient utilization of funding instruments.
* Emphasize the importance of monitoring and evaluation in demonstrating project impacts and milestones.

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Option | Rationale | Recommendation |
| Financial Realm | Establish a dedicated fund for sustainable innovation in agri-food value chains. | Address the current lack of funding hindering infrastructure development, encouraging a shift towards sustainable practices. | Create funds aligned with public resources and support. |
| Human Resources | Develop collaborative platforms and incentives to foster cooperation among value chain actors. | Address workforce shortages, build trust, and align consumer interests to enhance collaboration within the value chain. | Encourage cooperation, align consumer interests, and build trust within the value chain. |
| Knowledge Enhancement | Develop and implement a comprehensive knowledge-sharing framework within agri-food value chains. | Counteract the influence of neoliberalism by prioritizing knowledge dissemination and creating an informed industry | Prioritize knowledge dissemination and create an informed industry. |
| Power Imbalances | Introduce regulations to govern the pricing of products with significant environmental impact | Mitigate power imbalances, particularly in pricing, by establishing concrete policies for environmental considerations | Mitigate power imbalances through concrete policies and regulations. |
| Circular Economy | Enhance internal capabilities and communication within value chains for better adoption of circular practices | Address uncertainties in consumer acceptance and market distortion by improving internal processes and external regulatory measures | Improve internal processes and advocate for regulatory changes. |
| Sustainability-Oriented Innovation (SOI) | Establish concrete incentives for sustainable resource management systems. | Encourage SOI by providing tangible benefits, such as cost savings, increased efficiency, and easier access to credit. | Leverage public support and subsidies, especially within the new Common Agricultural Policy (CAP). |
| Policy Integration | Facilitate coordination between the CAP Strategic Plan and other relevant policies, such as RIS3. | Ensure a holistic approach to policy-making, addressing cross-cutting issues and enhancing the impact of agricultural innovation | Ensure a holistic approach to policy-making and effective utilization of EU policies. |
| Funding Efficiency | Streamline administrative processes and enhance coordination for more efficient utilization of funding instruments. | Overcome barriers like administrative burdens and lack of innovation understanding to maximize the impact of available funds. | Emphasize monitoring and evaluation for demonstrating project impacts. |

Table 3: Policy Options

## 5.1. Policy Brief

**Content**

Policy recommendations to enhance the Harmony in Chains: A Holistic Approach to Sustainable Agri-Food Practices

**1.** Establish a dedicated fund for sustainable innovation in agri-food value chains.

**2.** Develop collaborative platforms and incentives to foster cooperation among value chain actors.

**3.** Develop and implement a comprehensive knowledge-sharing framework within agri-food value chains.

**4.** Introduce regulations to govern the pricing of products with significant environmental impact.

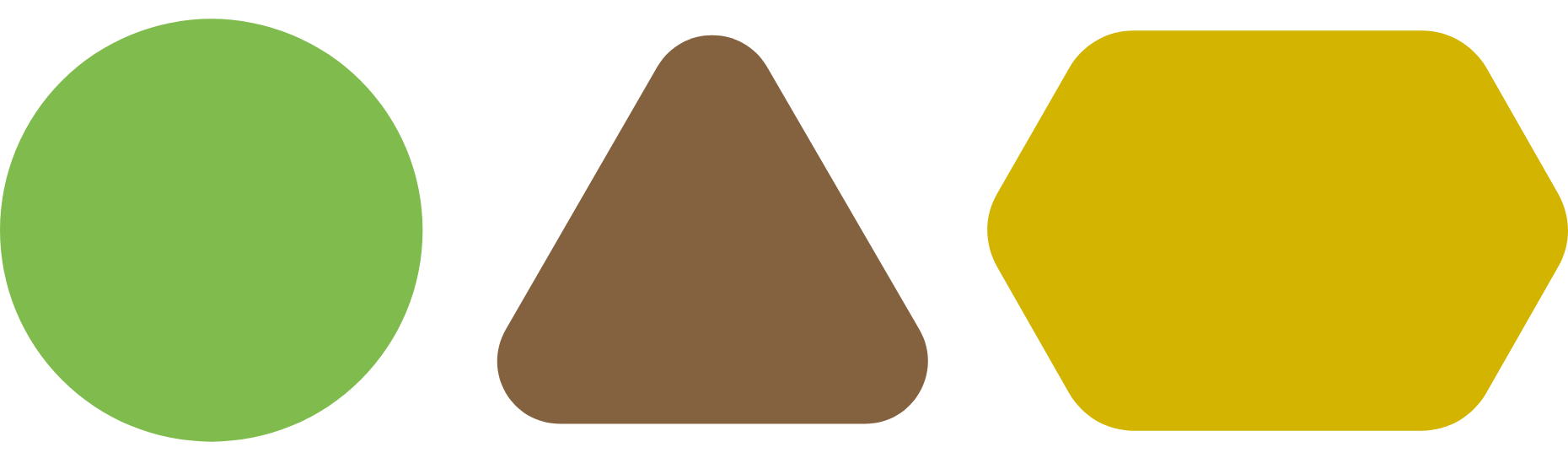
**5.** Enhance internal capabilities and communication within value chains for better adoption of circular practices

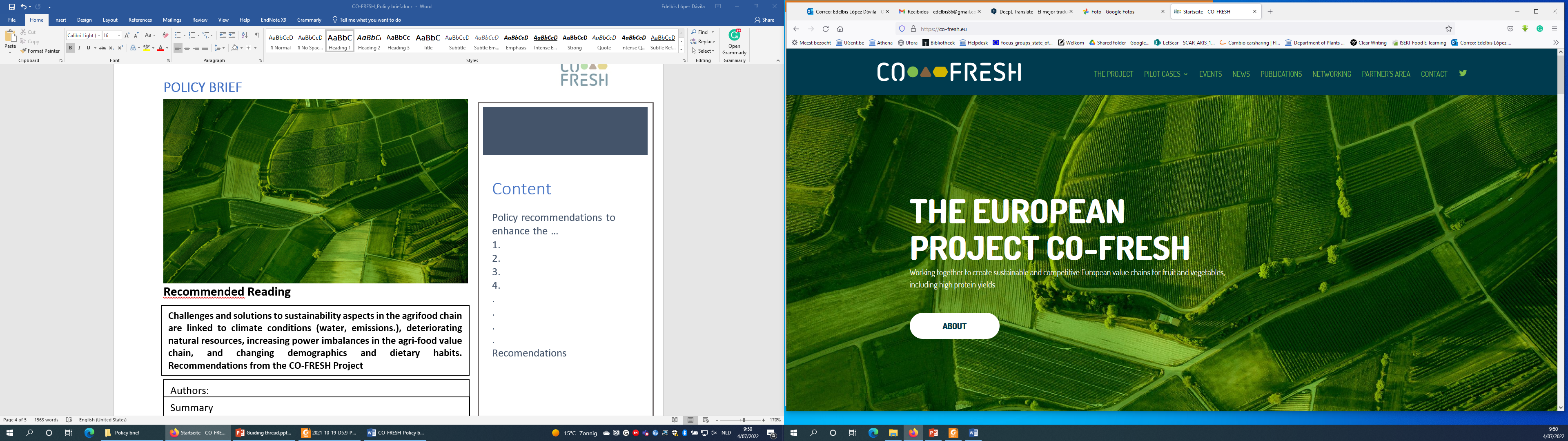
**6.** Establish concrete incentives for sustainable resource management systems.

**7.** Facilitate coordination between the CAP Strategic Plan and other relevant policies, such as RIS3.

**8.** Streamline administrative processes and enhance coordination for more efficient utilization of funding instruments.

Addressing the sustainability challenges in agri-food value chains requires a multifaceted approach that integrates financial, human, and knowledge dimensions. By implementing the recommended policy options, stakeholders can collaboratively work towards a more sustainable, innovative, and resilient agri-food sector. This holistic strategy not only addresses the identified challenges but also fosters a conducive environment for the adoption of sustainability-oriented innovation, ensuring the long-term success of the European agri-food value chains.





***Summary*:** In response to the pressing challenges facing European agri-food value chains, identified through four workshops with stakeholders, this policy brief proposes a comprehensive strategy for enhancing sustainability-oriented innovation (SOI). The overarching objective is to drive innovation that improves economic, social, and environmental sustainability through the integration of technological, social, organizational, managerial, and institutional innovations.

**Key Challenges:**

Insufficient funding leads to inadequate infrastructure, escalating costs, and a focus on immediate financial concerns over sustainability.

Workforce shortages, lack of collaboration, and misalignment between consumer interests hinder sustainability efforts within the value chain.

The influence of neoliberalism and a lack of comprehensive policies impede knowledge enhancement within and beyond value chains.

Large corporations wield significant power, exacerbating environmental impacts and emphasizing the need for shared goals and robust regulation.

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**Challenges and solutions to sustainability aspects in the agrifood chain are linked to climate conditions, deteriorating natural resources, increasing power imbalances in the agri-food value chain, and changing demographics and dietary habits.**

***Recommended Reading***

*1. Create funds aligned with public resources and support.*

*2. Encourage cooperation, align consumer interests, & and build trust within the value chain.*

*3. Prioritize knowledge dissemination and create an informed industry.*

*4. Mitigate power imbalances through concrete policies and regulations.*

*5. Improve internal processes and advocate for regulatory changes.*

*6. Leverage public support and subsidies, especially within the new CAP.*

*7. Ensure a holistic approach to policy-making and effective utilization of EU policies.*

*8. Emphasize monitoring and evaluation for demonstrating project impacts.*

# Conclusions

In conclusion, addressing the sustainability challenges in agri-food value chains requires a multifaceted approach that integrates financial, human, and knowledge dimensions. By implementing the recommended policy options, stakeholders can collaboratively work towards a more sustainable, innovative, and resilient agri-food sector. This holistic strategy not only addresses the identified challenges but also fosters a conducive environment for the adoption of sustainability-oriented innovation, ensuring the long-term success of the European agri-food value chains. Policymakers play a crucial role in balancing economic viability, regulatory effectiveness, and environmental responsibility, paving the way for a more sustainable future in the agri-food industry.

# Annexes

## Annexe 1: National workshop with local stakeholders' agendas





## Annexe 2: Main driving forces and barriers mentioned by PC stakeholders

### **Driving forces**

#### Voluntary developments to mitigate climate change effects

***“Pilot Cases (PCs) actively seek innovative solutions to combat climate change effects, particularly water scarcity and extreme weather conditions. However, current national policies lack incentives for investing in such innovations, hindering progress.”***

In many cases, the Pilot Cases try to involve innovation to tackle the negative effects of climate change voluntarily. Most of them are concerned directly by these effects such as lack of water, heat waves, droughts or other extreme weather conditions which lead them to act against them. The policy should support or give priority to these companies to encourage them to invest money to cope with climate change effects. In the majority of cases, the lack of water or droughts urges stakeholders to look for innovative solutions for water reservation, reuse of cleaning water or managing eco-friendly irrigation. More PCs mentioned that the current national policies have no incentives for investing in these technological or organizational innovations. For example, Florette would have been interested in reusing the washing water of salads but there are no current policies, taxes, or concrete projects to help the valorisation of such a project. Further, Terre de Zoe mentioned that they are engaged to decrease the irrigation water level, however, they are not forced to do so by any current policy, this initiative is driven purely by economic considerations.

Policies could capitalize on the voluntary willingness of value chain actors to achieve ambitious objectives in the mitigation of climate change. More focused lightning taxes or subsidies could inspire SMEs to integrate innovative tools into their daily operations.

#### Supported co-creation, and communication in value chains

***“PCs value communication and collaboration among stakeholders, fostering innovation in product and process development. Organizational innovations, like improving carcass quality and developing new products, result from increased communication and feedback.”***

During exploration, the weak negotiation power, unorganised lobbying, and shifted weights to retail, vulnerable farmers and food industries were mentioned as the main barriers to fruit and vegetable value chains. By contrast, nearly every PC stated that the highest value of the project was that it supported organising personal meetings and creating communications between value chain actors. The PCWG meetings allowed more communication, more data sharing and transparency. In many cases, the value chain actors started to communicate and give feedback to each other which brought innovative ideas or just some product or process development concepts. It was the case in the French Pilot Case where the original idea was to increase the quantity of local protein feed however the continuous meetings, the involvement of experts and the communication between the value chain actors (farmers, butchers, NGOs, consumers, retailers) opened new opportunities for collaboration. As a first result, the mutual understanding engaged actors to increase the quality of the carcass by understanding the different problems at the farm and retail levels. Farmers learnt how to develop the breading to help slaughterhouses process higher quality based on the consumers’ needs. This organisational innovation is so simple and important that the consumer's and other value chain actors' feedback is explained and incorporated into the processes. Secondly, the common brainstorming also resulted in product development as they found a solution to process the unused parts of the carcass in a new sausage recipe. In this case, farmers and HoReCa actors met to understand each other and find new concepts for the problems.

We learnt from these cases that there is a huge communication and collaboration gap between the actors of the value chain which hamper them from increasing their quality or quantity. In some cases, it may also be articulated that in some cases actors consider each other as enemies. In the CO-FRESH project the co-creation process, the support partners had a crucial role in breaking down these barriers and sitting people down around one table. This result highlights the importance of the innovation brokers, the EIP approach and the role of other AKIS actors who are the facilitators between the value chain actors. These (nearly invisible) animators should understand the given situation and conditions in each value chain, understand the language of the actors and be emphatic with different needs, also they must understand the innovation process to be able to help the creation of SOI.

#### Communication with the HoReCa sector

***“PCs recognize the importance of engaging with the Hospitality, Restaurant, and Catering (HoReCa) sector, leveraging their feedback for product development and market expansion.”***

The interviews proved that PC actors had mainly insubstantial connections with the HoReCa sector before the CO-FRESH project started however, more consumer acceptance assessments (T4.4) highlighted that the HoReCa sector is the entrance for the table of households. Restaurants have a pioneer role in presenting, and trying out new kitchen technologies, raw materials and recipes which can be tasted in the catering sector. More PCs said that the PCWG meeting made it possible to involve chefs, farm-to-fork groceries, and HoReCa experts in the common brainstorming or cooking workshop which opened the gate for further innovations. It was the case with PILZE and CRAPDL who were able to develop new products which can be sold for the HoReCa sector. From a policy point of view, we must mention here that the value chain approach, the food system approach is needed to find new paths for the fruit and vegetable sector and to reach the consumers directly. These (short) chains may achieve the farm-to-table approach which makes a direct connection between farmers, chefs and sometimes consumers; and may give direct feedback for farmers to be able to make the sowing plan, change varieties; create recipes based on real needs; being acquainted with unknown raw materials, and new varieties. Therefore it is recommended to subsidise the direct connections, and workshops in local food systems to promote the fruit and vegetable sector. The CAP 2022-2027 contains elements for AKIS and EIP-AGRI which can link these value chain stakeholders to invest in common actions. To facilitate these communications it is crucial to revise the eligibility criteria for common stakeholders’ actions. PILZE also pointed out that oyster mushroom serves the vegan diet, new dietary habits, new food systems, new consumer demands, social factors demand, and seasonal consumption. The sector needs to put more emphasis on these changes and awareness raising.

#### Innovation for SME

***“SMEs within the PCs emphasize the role of projects like CO-FRESH in supporting innovation actions, underscoring the importance of R&D for competitiveness and market sustainability.”***

Those PCs which belong to the SME sector such as Terre de Zoe, PILZE, Foodvalley, CRAPDL, and ECOWOC stressed that CO-FRESH opened a new vision for them by supporting their innovation action. They said that these kinds of projects such as Horizon 2020, Horizon Europe, EIP AGRI and other RDPs can involve SMEs to investigate innovation and first of all to understand the importance of R&D. More emphasised that these products, processes, and organisational innovations are the only way to develop and stay in the market, to be competitive and they would have been disabled to invest into innovation without supporting partners and researchers. Terre de Zoe said that their innovation 2 on probiotic food development using by-products was supported by UNIBO where researchers had a multidisciplinary overview of novel food, probiotics, nutrition, and processing methods which kind of holistic knowledge is not feasible and available at small scale level. PILZE said that PCWG brainstorming where marketing, communication and catering experts attended, helped them to find new paths, new products, and new markets for new products. The catering sector’s feedback and consumer acceptance assessment validated that pre-cooked products may open a new value chain. That is why they worked together with researchers to develop semi-processed food for those stakeholders who accept the new kind of products but are unable to handle fresh products from the fruit and vegetable sector. These pilots proved the need for a multistakeholder approach to innovation and the role of SMEs in this sector.

#### Sustainability labels

***“PCs align with the European Union Green Deal objectives, emphasizing environmentally conscious practices. They advocate for policies supporting sustainable operations and suggest the introduction of environmental quality assurance schemes and sustainability labels.”***

European Union Green Deal, the European environment, climate and energy policy’s objective is to boost sustainable development, for a sustainable economy. Many of PCs’ innovations were an effort to find solutions to such challenges. During the interview, we learned that these initiatives were driven by the PCs' consideration and recognition of sustainability needs. These organisations are environmentally conscious companies, their driving forces are just from the recognition that such operation and economic methods should be developed which reduces carbon footprint, even Florette mentioned that they are aware of the water footprint. Such corporate good practices should be recognised by the European Union and put on the policy agenda, i.e. supporting environmentally conscious companies. It should be considered to introduce EU measures applied by Member States which would encourage the use of such enforcement measures (such as tax relief for organisations). Further, the introduction of an environmental quality assurance scheme and a sustainability label would assist organisations in a positive way to be environmentally conscious when they make economic decisions and are eco-friendly. This kind of positive communication would be important for the fruit and vegetable sector to use these investments in marketing, to be more competitive and to engage environmentally conscious stakeholders.

**Obstacles**

#### Packaging

***“PCs face challenges in introducing environmentally friendly packaging due to limited consumer acceptance and technological constraints. They highlight the need for more ambitious promotion and R&D programs to address these challenges.”***

In D1.5. it was concluded that sometimes, in fact, policies acting as restrictions can stimulate the development and introduction of innovation as well, i.e. as a response to such limitations. This conclusion was referring to the Packaging EU Directive which, among other obligations, requires reducing plastic packaging. Florette and Pilze's innovation gave an example of such a challenge, both of them attempted to introduce new types of packaging to their production line. They examined the organic, eco-friendly solutions for packaging, but it also turned out that there was no strong consumer acceptance to pay more for environmentally friendly packaging. However, this topic is crucial for fruit and vegetable value chains which determine their marketing strategy, the shelf life and the waste reduction of perishable products. Their efforts failed, in other words, these innovations were not economically and/or technologically feasible, as food industry-specific evidence-based solutions are not available and the demand of the constructive but ambitious Packaging Directive imposes such burdens on the fruit and vegetable supply chain where these requirements may be followed under ordinary market conditions. The presently available technologies are not able to respond to the regulatory challenge about the special food safety and hygienic requirements related to food. Presently there seems to be some alternative to plastic packaging, however, the economic and social conditions are not enough supportive. This also highlights the discrepancy between competing requirements, i.e. less packaging versus food preservation. Therefore incentives like the Horizon research and development programmes, such as Co-Fresh may provide a lab situation for finding environmentally and economically sound solutions and results. The other aspect of this issue shows that voluntary work, intrinsic motivation of producers, and cooperation are not enough to change the economic and social acceptance of green packaging. That is why more ambitious promotion and R&D programmes are required to support the fruit and vegetable sector before implementing strict regulations to change the whole packaging system.

#### Composting

***“Composting agricultural waste is desirable for organic farming but not legally required, leading to low adoption rates. Advocacy is needed to amend regulations and promote composting practices.”***

Composting agricultural waste, e.g. from the orchard, is highly desirable as it closes the cycle of matter and energy on the farm. The benefits are obvious: saving resources, providing the farmland with valuable raw materials, generating higher and more stable yields and increasing their nutritional value. ECOOWOC steers decomposition processes in the right direction, which is a major problem because organic waste must be disposed of in the right way so that it does not harm people and the environment.

Composting of agricultural/orchard waste is linked to all these principles of organic farming, but the latest organic farming regulation 848/2018 EC does not oblige farmers to compost their waste. It is only recommended but not legally required. As a result, certification bodies cannot and do not require farmers to do so, except for certification bodies

for biodynamic agriculture, where the rules differ from general organic farming. As a result, most organic farms do not regularly compost agricultural or horticultural waste and often buy pelletized products from other countries or even outside Europe. In this way, the principles of IFOAM are violated very seriously under the current law. In Poland, 82% of farms are involved in plant production, and only 18% of farms are involved in livestock and plant production. This situation causes the self-sufficiency problems described earlier about organic soil fertilisation. It should be advocated that the current regulations should be amended in the coming years to promote the necessity of composting organic agricultural and horticultural waste and the gradual increase of livestock density on organic farms. Of course, transition periods should be long and widely communicated to allow farmers to adapt to the new regulations.

#### Online sales of fruit and vegetable

***“Some PCs innovate in online fruit and vegetable trade, facing regional differences in regulatory enforcement. There's a need for EU guidelines to ensure consistent application of regulations across Member States.”***

Remarkably two of the PCs’ innovations were related to the online trade of fruit and vegetables (ECOOWOC and COEXPHAL/UNICA) which seems to be proof that the share of “distance selling” of fruit and vegetables compared to traditional sales channels is increasing. However, the implementation of these new marketing innovations shows regional differences. Notably, ECOOWOC in Poland was facing such sanitary requirements from the national Food control agency when they applied for the operation permit, which applies to the operation of a retail shop. Other prior Horizon projects, i.e., the Smartchain project, already detected the problem that certain EU regulations are implemented in certain Member States more severely than the EU regulation itself. It calls again the need for EU guidelines for Member States and national programmes for training competent authorities for the proper application and enforcement of the relevant regulations.

1. <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/rur-06-2020> [↑](#footnote-ref-1)
2. OECD 2016:

   The value added tax (VAT) is applied to all goods and services and paid by consumers. The VAT rate applied to agricultural goods (i.e. vegetables, cereals) is 4%, whereas the standard VAT rate is 22% and a VAT rate of 10% applies to other food products (water, meat, fish) in 2018 and 2019. The VAT rate applied on fuel and electrical energy used by farmers is 10%. The VAT rate on fertilisers is 4% and on pesticides it is 10% for all users.

   Source: <https://www.oecd-ilibrary.org/sites/4d0e258a-en/index.html?itemId=/content/component/4d0e258a-en> [↑](#footnote-ref-2)