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Deliverable 6.1 - Report on the generic and specific drivers associated with the policy context

Transdisciplinary policy mapping of barriers and interventions for food system sustainability

Work Package 6 Science-Policy Interfaces and Relationship Building

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Authors	Mingyuan Chen (UNEXE), Victor Martinez-Gómez (UPV), Cătălina Rogozan (HCC), Dionisio Ortiz-Miranda (UPV), Mark Redman (HCC), Alex Inman (UNEXE)
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Overview of report

This Deliverable 6.1 compiles, analyses and contrasts the outcomes from two tasks of WP6 – 'Science-Policy Interfaces and relationship building', namely Task 6.2 – 'Policy and regulatory context mapping' and Task 6.3 – 'Participatory foresight exercises', which ran in parallel and intertwined. The purpose of this analysis is two-fold. First, it aims to feed into the design of the experimental research to be undertaken in the various empirical tasks included in WPs 3, 4 and 5. Second, it allows for identifying and discussing relevant policy gaps that need to be tackled in the EU and UK policy cycles to come.

The structure of the document is as follows. The next section contains a synthesis of findings from our engagement with Science Policy Interface (SPI) participants during 2023. This dialogue has been initiated to elicit an understanding of the key interventions required to facilitate sustainable food system transformation. This section shows and discusses the outcomes of the 16 SPI participatory foresight exercises undertaken in the 8 participating countries. In doing so, it provides a synthesis of the main findings relating to the diagnosis - identifying barriers towards a sustainable food system - and prescription – defining and prioritizing interventions to overcome those barriers.

Then, the policy and regulatory mapping undertaken across our case study areas screens the current policy interventions that have been identified by the VISIONARY research teams and external experts as having relevance to the conditioning of food actor behaviours. The contrast between the proposed interventions from the SPI and the current policy mapping allows for identifying and discussing the regulatory and policy gaps that should inform the design of food public policies. For this to be contextualized, Section 4 sets the scene for the current policy dynamics in both the EU and the UK.

The internal structures of the sections on SPI foresight and policy mapping revolve around, respectively, the clustering of (i) the topics addressed in the SPI exercises and (ii) the thematic clusters that group the experimental research that is being implemented in other WPs. The figure below aims to connect both clusters and summarise the rationale of this document.

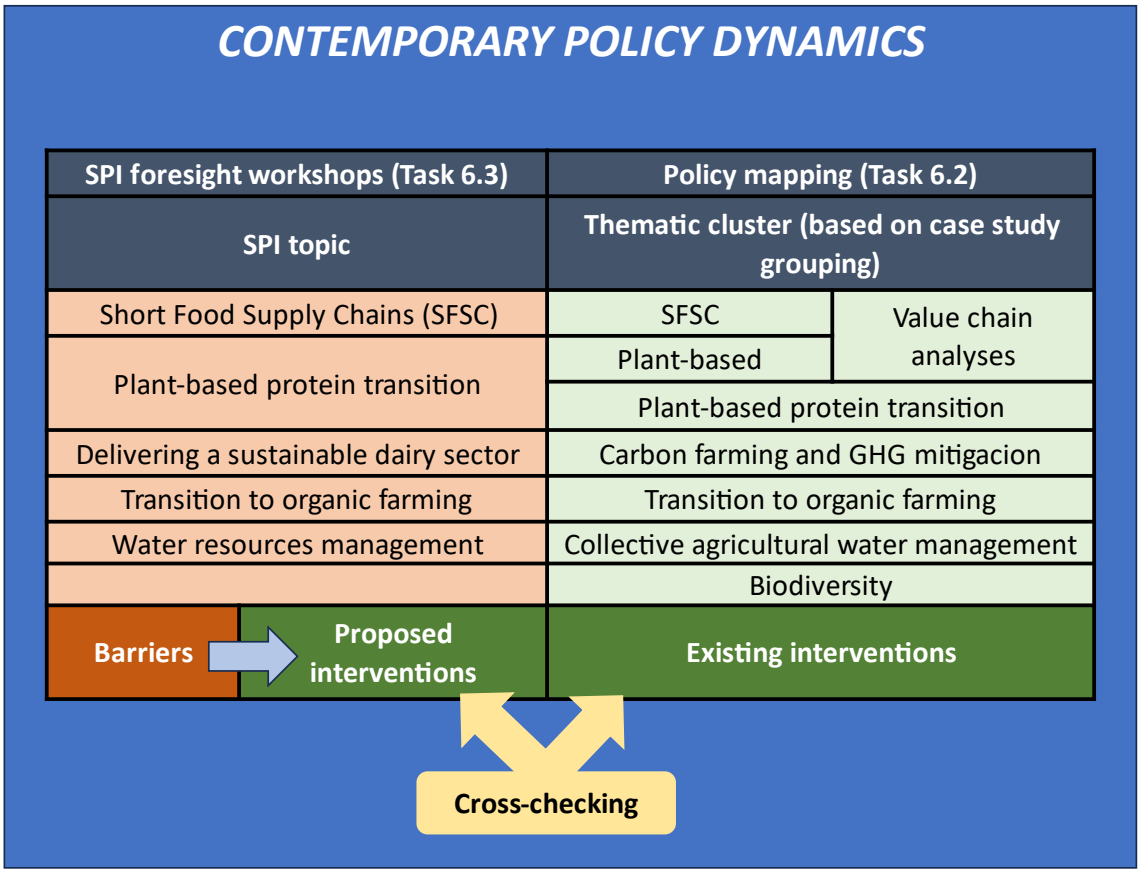

Figure 1. Deliverable rationale

Section 1 – Insights from Science Policy Interface (SPI) engagement

Introduction and background

As outlined in our milestone report (See M25 Participatory foresight exercises completed and documented), the VISIONARY team has undertaken structured foresight workshops with stakeholders in each of the 16 Science Policy Interface SPI case studies selected for the project. These workshops were designed to elicit an initial understanding of the key interventions that will be required to tackle the barriers and lock-ins relating to the issues each SPI is addressing. The objective of this exercise was to complement the desk based regulatory and policy mapping exercise reported on in Section 2 of this document.

The foresight workshops were structured to include the following stages (1) Diagnosis - understanding the current situation (2) Prognosis – analysing what change should happen (3) Prognosis prioritisation – identifying which changes should be prioritised (4) Prescription – making recommendations on how to implement the changes. This section of the report provides a synthesis of the main findings relating to the diagnosis **(barriers)** and prescription **(interventions)** dialogue generated from the foresight exercises undertaken. As such, the insights and recommendations contained within this synthesis represent the views of SPI participants, not necessarily those of the VISIONARY research team.

Table 1. Distribution of SPIs across partners, topics and countries

Institution	SPI Topic	Country
HCC	Short Supply Chains	Romania
HCC	Short Supply Chains	Romania
UNIWARSAW	Short Supply Chains	Poland
UNEXE	Short Supply Chains	UK
UPV	Organic	Spain
UNIWARSAW	Organic	Poland
FIBL	Organic	Germany
UNIABDN	Organic	UK
AKI	Organic	Hungary
FIBL/ ZALF	Plant-based protein	Germany
UCPH	Plant-based protein	Denmark
CBS	Plant-based protein	Denmark
CCAE	Dairy	Spain
UNITN	Diary	Italy
UNITN	Diary	Italy
AKI	Sustainable water resources management	Hungary

To facilitate reporting of the findings from the foresight meetings within a user-friendly structure, we have grouped the sixteen SPIs under five main 'topic' headings (1) Enabling decentralised shorter supply chains and local food system development (2) Transition to organic farming systems (3) Developing a plant/legume-based protein sector (4) Delivering a sustainable dairy farming sector (5)

Sustainable water resources management planning[1]. Table 1. outlines how these topics map across the partners and countries involved in the VISIONARY project. A number of common themes emerged within each topic which we have focussed on within the report, providing examples from individual SPI recommendations to illustrate specific context and detail.

Enabling decentralised shorter supply chains and local food system development

VISIONARY project SPI foresight meetings relating to the topic of shorter decentralised supply chains and associated local food systems varied in their scope; with Polish and UK meetings looking at the topic on a macro level whilst the Romanian SPIs focussed in on two specific alternative supply chain channels – Local Gastronomic Points (LGPs) and localised farmers markets. However, although different in scope, analysis of the various meeting outputs demonstrates clear synergies regarding the identified barriers to the growth of shorter decentralised supply chains and the necessary interventions to facilitate change.

Diagnosis of barriers

Lack of leadership and funding at a central and local government level

As has been flagged elsewhere in this report, for example when considering the organic sector, growth of a decentralised food system is widely cited within our SPI dialogue as being hampered by a lack of co-ordinated and sustained support from government departments. SPI participants across the case study areas perceive this lack of support to be most clearly exemplified by insufficient human and financial capital investment by the state in its various forms. For example, Romanian SPI participants report a disinterest amongst governmental personnel in the concept of LGPs and insufficient human resources exist within the Mountain National Agency, the department considered most appropriate to take ownership of the initiative.

Lack of collaboration and integration within the local food supply chain

Producers operating within local supply chains can often be their own worst enemies**.** Small(er) scale production units which typify most localised food systems tend to thrive best when they collaborate, either to produce, distribute or market their produce. However, as widely identified by SPI participants, there is a resistance amongst a significant proportion of the local supplier base to collaborate.

In Romania, SPI respondents point out that the development of farmers markets is being hampered by a lack of trust between small local producers, a lack of producer associations and an inability of producers to collaborate to provide a multi-product offering to the consumer. The homogeneous character of the food market offer in farmers' markets is not attractive to modern consumers who are looking for choice and convenience. Our Romanian SPI respondents were of the opinion the younger generation do not habitually go to farmers' markets. Lack of product diversity will not do anything to help change this situation.

Modifying this culture of producer independence requires management and leadership which will not materialise where a lack of political and financial support exists. As pointed out by Romanian SPI participants when discussing LGPs, new databases of producers will be required, and new visualisation tools (LGP maps) will need to be designed to promote LGP coverage. This will require on-going state

[1] Note only one SPI – convened by AKI in Hungary - resides within the sustainable water resources management cluster.

resources and intervention as such an initiative is unlikely to be instigated and maintained from within the local supplier community itself.

Lack of skills within the producer community

Running a successful food business at any scale requires significant skill, experience and training. In many ways, small producers need to be the most skilled within the agricultural community as they are the farm worker, the distribution agent, the marketer and the salesperson. It is often the 'soft skills' (business planning, administration, marketing) that are lacking in this sector, a characteristic identified by Romanian SPI participants when considering how to expand farmers markets in Brașov and elsewhere. Here, lack of business and entrepreneurship knowledge among small local producers is seen as a major impediment to growing the local food sector.

Lack of consumer buy-in to local food purchasing

Whilst sales of food within short supply chains appear to be growing, demand is still limited to a relatively small 'niche' shopper base – professionals, older people, infrequent recreational consumers. Insight from our SPI workshops suggests consumers remain wedded to the convenience of mainstream retail purchasing (largely through the supermarket network) which is typified by global supply chain characteristics. Arguments in favour of supporting shorter supply chains and local food systems have not reached the majority of consumers who remain largely disconnected from local producers within their respective communities.

Interventions

Improved government support

There appears to be a strong consensus cross the SPIs looking at short supply chains that progress in developing alternative food channels is heavily dependent on increased and sustained backing from public authorities; specifically in terms of legislative commitments, hands-on co-ordination of initiatives (with associated funding provision) and public procurement support. To expect the local food sector to achieve a step change in growth *from within* or spontaneously without state intervention is seen as unrealistic.

Regarding legal commitments and binding legislative instruments, these are seen as needed to convert policy maker rhetoric into real life reality. In Romania for example, SPI respondents suggest LGPs require supporting legislation, verified and adopted by the Parliament Senate. Importantly, these laws will need to be enforced which cannot be achieved without state backing. This legislation should be devised and drafted in a consultative and participatory manner by a combination of state entities (in Romania this means the National Agency for Mountain Area (ANZM), the National Sanitary Veterinary and Food Safety Authority (ANSVSA) and the Public Health Directorate (DSP)), GastroLocal Associations, Land Administrative Units (LAUs) and existing LGPs themselves.

Government intervention is also required to help co-ordinate and professionalise the local food sector. Polish SPI participants call on the government to assist with administrative changes that will enable farmers to reach a greater customer base. They look to the government to support marketing activities (e.g. packaging and labelling) and help the running of social media campaigns including associated training courses. Polish and Romanian SPI participants in particular also see it as a governmental responsibility to orchestrate collaboration within the supply chain and across enabling institutions. In Romania for example, SPI participants believe LGP development would benefit from more efficient inter-institutional collaboration between research organisations, public authorities and NGOs.

As with organic sector development (see relevant section in this report), the role public procurement policy (schools, hospitals, local authority administrative departments) can play in kick starting short supply chains received considerable attention by SPI participants. Tangible recommendations from

Poland include changes in the quality criteria governing the public procurement process which currently favours price over quality. Polish SPI respondents also suggest public sector institutions could provide administration support to local suppliers, for example to assist with logistics and distribution to public institutions.

Connecting farmers with consumers and ensuring product quality

There is very strong theme emerging from the SPI meeting analysis that a crucial element in building shorter supply chains is developing a relationship between consumers and producers. Importantly, this relationship needs to go beyond a purely transactional exchange to create a connection based on a sense of shared responsibility for the stewardship of the land. SPI participants in the UK were particularly vocal on this issue suggesting the connection between buying from shorter supply chains and protecting the environment should be a key element of any communications campaign.

There is a need to create an easier way for farmers to sell their products (the farmers do not know where to sell their products and how to advertise them correctly) and consumers need to have trust in – and understand the value of – the products they are buying. SPI participants identified a number of ways to achieve these outcomes:

- In our Polish SPI, participants recommend creating new places (e.g. “trade zones”) where farmers can sell products from short food chains and where consumers can be reassured they are buying locally sourced and environmentally friendly products.
- Developing on-line hubs. Our UK SPI will be looking in detail at the Tamar Grow Local (TGL) on-line food hub which has been successfully running for several years in South West England. This provides a portal and shopping platform between local consumers and producers and also manages storage and delivery services. The idea of on-line hubs has widespread support from the SPI community in all countries. Initial consultation with relevant TGL hub staff in the UK suggests there is a shortage of human resources available to focus on the marketing effort required to optimise customer retention, up-buying and recruitment. Rolling out such hubs on a broader basis will require extensive capacity building, especially regarding software training.
- Physical farmers markets (usually situated in urban locations) have traditionally provided a well-recognised sales channel for short supply chains. Importantly, they serve as an opportunity for producers and consumers to meet each other ‘in the flesh’. However, SPI respondents in Romania were of the view farmers markets require significant modernisation if they are to keep pace with 2^{1st} Century requirements. Necessary interventions range from providing basic infrastructural upgrades (e.g. adequate sleeping places for producers, toilets, heating control, storage, parking) through to the introduction of digital technology such as credit/debit card facilities and QR code technology. The former can be introduced to make the transactions easier and more convenient, and the latter will allow consumers to scan a code and learn more about the producers and their agricultural activity. Social media campaigns are also seen as necessary, particularly to attract the younger generation who currently view farmers markets as a place for older shoppers. As a practical first step, Romanian SPI respondents suggest piloting the modernisation of 3 farmers' markets - Dacia, Astra and Star markets. Also the piloting of a ’one day per week’ farmers' markets in 5 neighbourhoods that don't currently have a permanent farmers' market in place.
- Linking the tourism sector to local producers. In Romania, SPI participants are considering the novel idea of Local Gastronomic Points. Within this mechanism, tourists are able to access and buy local produce as part of their visitor experience. For this to become a reality, a number of interventions are required including mapping and promoting LGP coverage, ensuring compliance with LGP supplier criteria and creating a user-friendly database of local producers.

- Trust with consumers whatever the sales channel can be enhanced by providing details of farmers including their cultivation methods and practices. Product labelling must be transparent including the locality (km radius) from where the product comes from.

Public Education

SPI participants across the board strongly articulated a view that any initiatives designed to promote local connections between consumers and producers need to be supported by a well-funded national education programme targeted at all age groups. For example, Romanian SPI participants suggested the LGP concept requires a promotional campaign at national level. Polish SPI dialogue focussed on clear and consistent messages to consumers explaining the merits of buying from a short supply chain. SPI participants in Poland also propose changes in nutritional education from an early age e.g. school children should obtain knowledge in healthy eating, food preparation and the socio-economic and ecological benefits of food from short food chains. In the UK, SPI participants see value in local suppliers visiting schools to talk about local growing and supply and its benefits. They also advocate school visits to local suppliers (e.g. cheese making facilities).

In the UK, SPI participants see value in promoting the concept of 'grow your own' as a way of educating the public about food production and preparation. It was felt the process of consumers growing their own food at home (even in very small amounts) will help to develop a stronger sense of food provenance and value. However, it was noted that many consumers do not have suitable space so policies would need to be implemented by Local Authorities to provide more allotments and support local communities to start gardening clubs. Of note, it was suggested this concept could be extended to the school sector through the development of school allotments or mini farms.

SPI dialogue in the UK also focussed on interventions based around mobilising influencers to convey key messages. These might be at a local level (sports clubs, schools) and national level (celebrity chefs, sports stars). In the UK, it was felt that high level public figures from the scientific community trusted by the public (e.g. Professor Chris Whitty who advised the government during the covid pandemic) would be very effective. In addition, SPI participants in the UK see a key role for influencers from the farming community. It was noted there are some very active farmers on social media like Gareth Wynne Jones who is a big advocate of growing your own and short supply chains. More people like him should be encouraged and supported to 'spread the word'.

Enabling greater farmer collaboration

Successfully implementing producer collaboration will be a difficult task. Analysis of SPI dialogue reveals a limited number of intervention suggestions thus far. In Poland, the idea of connecting farmers into producer groups and creating "incubators" for short food chains at the regional level received considerable attention. Resources would be needed to employ experts in such incubators who would be able to guide and support producers throughout the entire process.

In general, the emphasis appears to be on not reinventing the wheel. Rather creating new mechanisms, effort should be exerted on simplifying and implementing existing ones such as the Community Supported Agriculture model and enhancing the activity of Cooperatives. Polish SPI participants identified a need for better guidance materials to facilitate the implementation of these solutions.

Transition to organic farming systems

It is very interesting to note from the information reviewed that whilst individual SPI contexts may be different, there is a very strong degree of similarity in opinion regarding diagnosis of the issues hampering an accelerated transition towards an organic farming future. Indeed, SPI participants identified a common range of demand side, supply side and political economy variables that appear to have universal relevance across all the SPI case studies analysed.

Diagnosis of the barriers

Lack of policy integration and co-ordinated leadership at a national level

Promotion of the organic sector will require multiple government departments – e.g. Agriculture, Environment, Health, Education, Business Development – to develop consistent communications and messaging in support of organic farming. There is a strongly held view across the SPIs that this situation is not currently in place, thereby undermining the sector from developing further. Frustration is evident regarding what is seen as a greenwashing of conventional agriculture through the use of ambiguous terminology such as 'regenerative agriculture'. Policy makers need to make a clear distinction regarding the relative merits of organic farming compared with other systems.

There is also a sense that current financial support for agri-environmental objectives via the Common Agricultural Policy and national level grant schemes is weighted towards habitat creation in specific spatial units (Ecological Focus Areas) rather than encouraging ecosystem service provision through organic agriculture. There appears a lack of willingness at EU and national government level to commit the funding necessary to support organic sector growth directly.

Increased public sector procurement of organic food featured strongly in SPI discussion as a tangible mechanism for demonstrating governmental support for the sector and injecting a sea change in demand. However, budgets available for public procurement of organic are limited, procurement rules (e.g. quality standardisation) are very restrictive and governmental bureaucracy acts as a barrier to progress. For example, Scottish SPI participants outlined a situation where multiple government departments are involved in setting procurement rules, making a change towards enacting common public procurement policy rules/standards very difficult to achieve.

Structural inadequacies within the producer profile

The smallholdings within the organic sector are stumbling where it appears collaboration and multi-producer joint ventures are rare. Because of this structural profile, the cost of production, distribution and certification presents a major challenge for smaller organic producers. SPI participants in Poland suggest the fragmentation of the sector makes it difficult for individual producers to secure contracts with larger buyers given their inability to guarantee security of supply.

Lack of market channels

All SPIs identified a lack of adequate marketing channels as a major impediment to the organic sector. In Spain, it was noted that most Cooperatives are not interested in organic (exceptions Bèlgida and Sagunt). Cooperatives are regarded as providing a lifeline for many conventional farmers, particularly older members of the farming community and part-time producers.

Sub-optimal distribution networks

There is a lack of local distribution networks for organic suppliers. Where distribution networks are identified by SPI participants such as in Scotland, the perception is these are controlled by large operators making it difficult for smaller producers to access these platforms.

A lack of value chain infrastructure

A commonly cited barrier to the organic sector is the lack of processing facilities (e.g. pack houses, abattoirs, storage facilities) available to organic producers.

Lack of advice to producers on organic farming

Extension advice to farmers wishing to adopt or improve organic farming techniques is insufficient and reactive not proactive. SPI participants in Scotland remarked that an advisory service is offered to farmers on a one-to-one basis if requested by farmers, but in general, there are a lack of targeted information programmes promoting the transition to organic farming.

A consequence of a lack of advice and training is a shortage of professional organic farmers with an appropriate skill set. SPI participants in Spain suggest training is particularly crucial with the growing of complex crops such as oranges. Spanish stakeholders also maintain that a lack of professional organic farmers prevents success stories from proliferating, thereby perpetuation "false myths" about the sector. These include narratives associating organic agriculture with poor productivity, ineffective biological controls, lack of market demand and increased workloads compared with conventional farming.

Lack of consumer awareness

Demand for organic produce appears to have reached a plateau. SPI participants suggest this is due to a lack of education on sustainable food consumption and the positive contribution organic agriculture can play. In Poland, SPI participant discussion highlights a low level of public trust with organic products being described as "credence goods" (a type of good with characteristics that the consumer cannot observe after purchase and consumption). Outside of certification, it is impossible to distinguish whether a product is organic or not. It is the view of SPI participants in Poland that a lack of public trust in organic agriculture has been exacerbated by a deliberate campaign of 'Black PR' amongst certain sections of the media.

Interventions

Government action

It is evident from the consultation undertaken with SPI participants across the different case studies that a consensus exists regarding the need for government intervention and focussed policy support. The organic sector cannot hope to expand without leadership from the top. Whilst a wide range of ideas were proposed during the foresight workshops it is possible to identify a number of core priority themes.

Public policy decision makers need to overtly champion the organic sector and place it front and central within any future sustainable agricultural and food policy strategy. SPI participants believe the contribution organic agriculture can make to solving environmental policy challenges currently lacks articulation. For example, our SPI participants in Scotland suggest there is a lack of organic representation on advisory boards and action groups concerned with the discussion of broader sustainability related strategies, such as biodiversity and climate zero. Central governments will need to allocate defined and enhanced budgets to resource appropriate mechanisms for organic sector expansion. Bespoke government action plans are required detailing specific grant support for organic crop production and enabling regulations to influence consumer decision making. There is also a need for staff within public administrations to improve their own technical understanding of organic agriculture. Indeed, our Spanish SPI participants recommend the creation of a specific department in the Regional Ministry in Spain acting transversely with other departments and centres dependent on regional government. This office would function as a one-stop-shop for advice to any regional

government team. There are doubts whether the political will to establish such a department exists at the current time.

In addition, resources should be secured for scientific research to measure the ecosystem service benefits from organic agriculture. Our Hungarian SPI participants identify a need for policies to promote life cycle analysis across different product lines to inform buyers within the supply chain. Transparency and evidence-based decision making is regarded as crucially important. For this reason, Polish SPI participants argue it is crucial to change the way organic strategies and programs are developed, ensuring input from the scientific community. Scottish SPI participants concluded forums are required to ensure high-level experts from the industry and science (academia) closely interact with policy makers to demonstrate benefits and promote further understanding of organic systems.

As can be seen from our SPI dialogue on the local food sector, a strong theme emerging from the SPI foresight discussions on organic expansion is the role public sector institutions can play in securing demand via procurement policy alignment. For example, Scottish SPI participants suggested a mandatory 30% of all food cooked in public sector institutions should be organic. Setting enabling instruments to allow targets to be set for organic food procurement is regarded as key. For example, in Scotland, Local Authorities will be able to set local targets/aims for sustainable or organic public procurement within their 'Good Food Nation' plans. In our Spanish SPI, a need for the reinforcement of ecological, proximity and seasonal public procurement rules was vocalised. Other interventions mentioned by SPI participants to facilitate public procurement include purchase benchmarking (across Europe) to identify gaps in strategies and performance. It was suggested governments need to push access to public procurement data from industry stakeholders and agencies involved in public procurement to inform strategic investment decisions in this policy area.

Organic value chain and distribution Infrastructure

It was evident from SPI participant insight that there are a number of structural barriers within the organic sector which are limiting the value addition through processing and distribution of organic produce. A simple example came from our Polish SPI where a lack of drying facilities is hampering organic farmers from upscaling their activities. Insights from Poland also suggest distribution co-ordination is required to avoid large negative environmental externalities occurring within organic supply chains e.g. individual producers bringing products to the city individually not collectively leading to excessive emissions from inefficient transportation.

Of note, food processing and distribution networks and associated infrastructure are regarded as being dominated by large retailers' interests incompatible with meeting smaller scale supply and demand needs. A number of innovative interventions emerged from SPI dialogue. For example, in Scotland, the idea of mobile slaughter units and small-fixed abattoirs was suggested as a means of unlocking barriers to organic meat supply by smaller localised producers. In Poland, connecting organic farmers within the same locality is seen as crucial to enable the security of supply (volume) required to secure certain retail chain contracts. There remains a big question regarding who has the resources to develop such alternative distribution networks; with an emphasis on the need for state intervention emerging from discussions with SPI participants. In Scotland, Local Authorities are identified as potentially the optimal actors to co-ordinate (and fund) the establishment of local distribution hubs, to be run as cooperatives. In Hungary, establishment of alternative supply chain initiatives has been hampered by inadequate monitoring and inspection procedures. This is again an area where government (ideally local government) is seen as being able to play a role.

Market development

Processing and distribution problems in the organic sector are compounded by significant limitations in marketing infrastructure. This was a universal observation made across the SPIs, all of which identify a lack of channels through which locally produced organic food can currently be sold to the consumer. In terms of interventions, there is very strong consensus in favour of establishing socio-technical innovations in food provisioning services, particularly the use of local digital food platforms or on-line food hubs. Several examples already exist, for example in Hungary where SPI participants cited a website facility hosted by the Hungarian Organic Farming Association (Magyar Biokultúra Szövetség). Whether a physical or on-line market place, our Polish SPI participants suggest it is important to create retail space where a full range of organic goods are available. Consumers want to buy everything in one place for convenience reasons. In Poland, SPI participants identified a need to promote and improve the use of ODR e-bazaars, suggesting these are a relatively inexpensive means of connecting producers and consumers.

In addition to the development of on-line market places, SPI participants in Poland also stress a need to encourage physical markets in urban areas. To enable this to happen, SPI dialogue focussed on facilitating organic farmer access to cheaper retail space. Cities need to offer lower cost market space for organic farmers than for mass marketers. Polish SPI participants believe consumers associate organic food with high prices (such as those available at BioBazar, Fortress) and need examples of cheaper affordable organic products. Cheaper retail space for organic farmers would assist in this process such as The Earth Market – Wroclaw.

Another intervention strategy highlighted as being urgently required to grow organic market channel development is the facilitation of collective action or collaboration amongst producers. It is not too much of a generalisation to state that farmers tend to be skilled at producing products but less skilled at marketing their produce to the consumer. For example, our SPI foresight meeting in Germany concluded that new-organic farmers do not know how to market their products once conventional sales channels disappear. In Poland, social norms exist within the farming community which reinforce the farmers role as a producer not a seller. Where farmers are left to their own devices, a sub-optimal outcome is likely. SPI participants across the board report there are a lack of experts available to mediate these new marketing channels and contacts. Producer groups and associations exist but capacity is insufficient at the current time.

Increasing consumer demand

It is no surprise that whilst considerable discussion within the SPIs has focused on providing solutions to supply side problems, interventions to increase consumer demand are regarded as crucial to grow the organic sector. Despite increasing organic sales in recent years, core demand for organic produce remains niche across Europe. Developing a more mainstream customer base (wider demographic profile) will be a vital step in the journey.

There is a very strong consensus that interventions to increase demand need to start with school age learners. SPI participants see a significant role here for the state, particularly Ministries of Education working with other relevant government departments. A broad range of initiatives are recommended by SPI participants. For example, in Spain, the creation of digital content in schools is seen as a good starting point, leveraging existing content already generated by producers and operator networks. In addition, introducing an 'organic school menu' within the school curriculum is suggested by Spanish SPI participants, building on existing pilot experiences (e.g. The Hortacuina programme). In our Polish SPI, participants feel education programmes focussed on agricultural ecology in schools should make sure they target teachers and parents as well as children. External educators visiting kindergartens and

schools should be encouraged. Conversely, Polish SPI participants also favour the use of demonstration farm visits allowing the public to gain first-hand experience of a farming environment.

All SPIs strongly suggest broad public education (children and adults) programmes are needed on diet, specifically the interaction between diet, human health and environmental sustainability. In Scotland, SPI participants are of the view that food policy across government (driven by all government departments, not just the Department for Education) should consider the potential to promote more informed consumption habits. It was noted by Spanish SPI participants that there is often division and separation between government departments on matters of food policy which makes integration of clear and consistent messages very difficult.

Regarding clarity of message, it is very apparent from SPI dialogue that participants perceive there to be significant confusion amongst the public regarding organic product authenticity. This has led to what might be described as a deficit in trust. For example, Polish SPI participants suggest regulation of "eco" labels should be introduced, given high levels of inaccuracy in product description. In the same vein, there needs to be greater transparency with consumers that local, regional and bazaar products are not always organic. Clear labelling of products is required to communicate their relative environmental impact. With this objective in mind, SPI participants in all countries favour the introduction or reinforcement of clear certification programmes. For example, in Hungary, SPI participants call for the introduction of an organic quality/trademark system, overseen by a coalition of the Ministry of Agriculture and producer organisations. In Spain, SPI participants identify a need for the creation of organic certificates for catering, school gardens and also residential and urban gardens.

Providing organic food with differentiation from conventional products within the market place is a common theme emerging from our SPI dialogue. To this end, participants across all our SPIs articulate the idea of promoting quality marks for specific organic food products based around regional/local provenance (a distinct geographical locality). This in turn will require capacity within producer organisations and a way of combating the transaction costs involved in setting up locality-based quality marks.

By way of a final observation on SPI dialogue regarding increasing consumer demand for organic food, it is noteworthy that SPI participants identify a need for a concerted media campaign using a variety of different channels from conventional media (TV, radio) through to online social networks. Our Scottish SPI participants prioritise the development of a national Organic Action Plan within which effective education and information campaigns targeting consumer awareness and the promotion of sustainable consumption practices should play a major role. The downside of professional media campaigns is the expense but, as recognised by Spanish SPI participants, EU funds are available to finance this type of action. Use of public opinion leaders is seen as particularly important, SPI participants in Poland being vocal in favour of celebrity trend setters, chefs and bloggers supported by pro-environmental journalists. Polish SPI participants also advocate the use of social diffusion models informed from the social science literature.

Upskilling within the organic farming sector

In addition to a lack of marketing skills within the organic farming community, it was noted by SPI participants in all countries that upskilling in organic farming production techniques is required for the sector to grow. A long list of recommended interventions was generated from the SPI dialogue. In Spain, a major emphasis is placed on a need to enhance current formal training of organic farmers to professionalise the workforce. Here training is classified into three classes: 1) continuous training 2) formal training 3) technical training. To complement formal training, a common theme emerging across all SPIs is the need for demonstration farms and knowledge transfer programmes facilitated by

skilled agricultural extension advisors. It appears there is a lack of supply in extension advice in many countries such as in Hungary where a strengthening in organic sector expertise within the NAK's (Hungarian Chamber of Agriculture) expert advisory service is considered necessary. This process could be assisted through establishing accredited organic training for advisors.

There is also a need for increased research and development to help farmers implement new ideas. For example, in Spain, SPI participants call on both public (Universities, National Research Council) and private actors to develop R&D programmes focussed on ecological fertilisation, natural predator control and 'smart agriculture' (e.g. using technology such as satellites and drones. Facilities to analyse farming systems/crops is also seen as advantageous such as in Hungary where SPI participants advocate the establishment of independent testing locations/facilities. SPI discussion in Hungary also yielded interesting suggestions for funding mechanisms for organic agriculture R&D including a hectare-based contribution levied on producers to help research and development financing. This funding should exist alongside a share of agri-environmental subsidies specifically allocated to the organic sector.

Increasing organisational capacity amongst organic farmers

There has been much written in the academic literature suggesting that farmers have much to gain from cooperation, be that in the production or the selling of their produce. SPI participants in all case studies indicated cooperation between organic farmers is key to the sectors development. Several interventions are suggested including funding support to develop cooperatives and farmer producer groups. Polish SPI participants champion the idea of cooperation both between farmers producing the same crop (can help to secure contracts with larger buyers) but also cooperation amongst farmers producing different products - e.g. fruits and vegetables. For example, this enables farmers to meet consumer demand for choice and shopping convenience (consumers want variety and the ability to buy everything in one place).

Developing the plant-based protein sector

There has been significant interest in recent years in the development of the plant-based protein sector as a means of helping to address climate change concerns. Environmental NGOs such as the Worldwide Fund for Nature (WWF) are calling for a 'less but better' meat future where more intensively produced livestock protein is replaced with plant-based alternatives. Three of our SPIs are looking at the factors required to develop the plant-based protein sector. In the initial foresight meetings undertaken, our German SPI has considered both supply and demand issues whilst participants within our two Danish SPIs have mainly focussed on demand side interventions.

Diagnosis of barriers

Based on extensive observations made my SPI participants it is possible to identify a range of factors currently impeding the development of the sector.

Insufficient capital, labour and technical capacity amongst producers

There is currently a lack of equipment available for the growing, drying, cleaning and processing of protein crops. Post-harvest equipment is particularly important given that many large-scale caterers demand the supply of pre-processed products. To invest in such equipment is extremely expensive which is a large risk for the producer when demand is uncertain. There is also a shortage of appropriately skilled and affordable labour for preparation and post-harvest treatment facilities. Selling raw produce to the trade without any value addition processes such as cleaning and preparation results in low prices and income volatility.

It is also difficult for producers to guarantee quality assurance of protein crops compared with more "common" crops. This is compounded by the fact that breeding programmes for 'niche' protein crop

varieties have been lacking for decades. Diversity of legume varieties has been lost over the years, and breeding goals have remained unclear resulting in germination vulnerability and yield variations.

Consumer demand for protein foods is weak

Mainstream consumers remain unconvinced that alternative protein food represents value for money. Our German SPI participants report an "After Corona" effect which has led to the closing down of many natural food shops due to shifts in household spending priorities. In addition, entrenched eating habits "do not fit" with legume-based products, particularly with regard to the consumption of convenience food. Coupled to this, legume products are not considered "attractive" enough by many consumers and the socio-ecological arguments in favour of plant-based protein remain unclear to the buyer. On a practical note, when it comes to cooking in the home, many households lack knowledge regarding the preparation of legumes for the table.

Lack of an enabling political and economic environment

In addition to the producer and consumer orientated barriers identified above, insight from SPI participants suggest there is a lack of congruence in public policy objectives relating to plant-based protein, resulting in conflicting targets and objectives. German SPI participants also report the various grower Associations relevant to the plant-based food sector are also not aligned.

Wider structural economic barriers are also numerous. From a producer risk perspective, it is currently far easier to market established crops which can always be sold as animal feed as a fall back position. With acceptance of legume protein crops being slow and fluctuating in the food sector, processing, distribution and marketing channels are unlikely to develop until demand reaches a level of consistency. As described by German SPI participants, developing branding and labelling celebrating national provenance (a potential advantage) is currently very difficult when it is not possible to guarantee availability of sufficient quantities of 'German only' produce. In addition, it is very difficult to increase demand for domestic produce whilst a significant price differential exists between imported & domestic goods.

Interventions

Increase consumer awareness and interest in plant-based protein

SPI participants in both Denmark and Germany place significant emphasis on the need for active communications campaigns to improve consumer affinity and 'buy-in' to eating plant-based protein. Possibly not surprisingly, SPI participants look to the state to update and enhance food related learning materials in schools and further education for teachers. However, private sector communications channels were also identified. For example, in Denmark, participants highlighted a role for the renown Danish cookbook 'Karolines Kogebog' (produced by ARLA Foods – a large Diary cooperative) which could place a greater emphasis on dishes containing pulses. It was suggested the cookbook should be sent for free to all Danish households in physical form and multimedia channel distribution should also be developed including establishment of a mobile phone based app. Other communications campaign interventions should include use of TV and Youtube to publicise the idea of a 'meat-free week' or a 'week of pulses' marketing Danish pulses. In Germany, SPI participants discussed the need for farmers to engage directly with consumers by taking part in various events.

Enabling consumers easy access to experiencing the taste of plant-based protein food is considered an important intervention by our SPI participants. For this reason, increasing more legumes in take-away/convenience food is a tactical imperative. Of crucial importance, plant protein options must taste nice to gain consumer approval with techniques like fermenting identified within SPI discussion as having the potential to facilitate such an outcome. Our Danish participants mentioned tastings in supermarkets would be a good idea, together with recipe suggestions strategically placed at POS

locations. More prominent placement of plant-based products on supermarket shelves is also recommended (in conjunction with less price discounting for meat based alternatives).

Suggested interventions by the public sector to enable greater exposure to plant protein options include the use of public canteens and kitchens to provide best practice examples of tasty dishes using pulses. Training and education of kitchen staff will be required to maximise opportunities here. As with SPI discussions on organic and local food promotion reported in other sections of this report, it was felt public procurement has a significant role to play in generating consumer demand for plant-based meal choices. SPI participants suggested municipalities should implement lifecycle analysis and impact assessment criteria into their food buying decisions. In addition, official dietary guidelines should be mandated in all public kitchens. One of our Danish SPIs went as far as stating all public kitchens should be using a minimum share of legumes, as a proportion of all food served.

Building farm level capacity

Growing alternative crops is a risk to farmers, many of whom simply cannot afford to make mistakes. SPI participants outline a number of interventions to help reduce risk and building capacity within the farming community. A well funded and expert extension service is seen as a fundamental building block, to provide state of the art agronomic and growing advice to producers. It was felt significant knowledge already exists regarding legume production techniques. What is needed is the packaging of this information into a user-friendly format suitable for on-the-ground growers to implement. Where new research is required, farmers should be provided with the necessary scientific advice to implement this. SPI participants in Germany identify several key knowledge transfer priorities including where to grow which crops, disease management control and multi-cropping cultivation techniques. Strengthening entrepreneurship on farms is also perceived as necessary. Of note, a programme of advice and research should also be complemented by financial support – over a sufficient time period - to establish new crops. German SPI participants suggest current three-year grant horizons are not long enough to encourage producers to engage in new ventures. Pioneers should be rewarded within any future funding support mechanisms.

Improvement in legume value chain and distribution infrastructure

Interventions at the farm scale to improve product supply are important but as identified in the diagnosis narrative above, producers will also need appropriate supply chain infrastructure in place; both in terms of physical infrastructure but also organisational capacity. SPI recommendations include steps to improve regional scale processing plants, establishment of producer groups and investment in supply chain managers able to build networks and invest time in facilitating supply and demand contracts between multiple buyers and/or sellers.

Establishing a supportive political and regulatory regime

A need for government intervention with regard to education and public procurement has already been noted above. However, SPI dialogue identified further government level involvement is required in two additional spheres of activity.

Firstly, on a political level, leadership is seen as necessary to generate a fundamental public debate about what society wants from the food system and what role plant-based protein should play within the mix. What is the common vision going forward? If a transition to a greater level of plant protein within the diet is seen a preferable, a transparent discussion is required regarding the part wider society plays in this journey? Farmers cannot be expected to shoulder all the risks alone.

Secondly, SPI participants perceive a need for better regulations to facilitate both the supply and demand side of the plant protein market. Consumers need to understand the credentials of the products they buy which will require establishment and enforcement of better product attribute

declarations and transparent labelling. Standards must be high but at the same time they must be achievable and realistic for farmers. For example, when discussing attributes such as alkaloid and TAC levels, German SPI participants express concerns these might be set too high if left to the jurisdiction of the trade alone.

SPI participants in both Denmark and Germany also voice the controversial idea of utilising the fiscal system to incentivise legume consumption; specifically VAT exemption. It is appreciated this will require taxation technicalities to be addressed and will be likely to receive significant resistance from the retail sector due to increased administrative burden and political pressure from external stakeholders. In the Danish SPI, this type of intervention is currently being considered, as the Danish Government plans to impose a tax on CO_2e emissions on farm production. This would tilt the economic incentives for consumers towards plant-based foods. At the time of the workshop the policy proposals were not clear for the participants.

Delivering a sustainable dairy farming sector

Our three SPI communities (two in Italy, one in Spain) looking at improving the sustainability of dairy farming identified a number of common factors currently compromising improvements in the environmental performance of the sector. There was also significant overlap regarding the necessary interventions required to reduce environmental externalities from the dairy supply chain which are likely to have broad applicability to other countries and contexts.

Diagnosis of the barriers

SPI dialogue reveals there is broad agreement across the sector that the dairy supply chain can have a negative impact on Climate/air quality (GHG emissions) and water quality (surface and ground water pollution). There is also a recognition that the sector uses a high volume of water and that rising temperatures can have a negative impact on dairy cow welfare.

What is evident from discussions, however, is a lack of consensus around the *scale* of the impact and there is a lack of cooperation amongst the actors within the dairy supply chain regarding taking actions. These problems appear to be compounded by a lack of trust in the science around measuring impact and mitigation effort. Whilst SPI participants from the producer community accept that many diary farmers have a skills deficit in sustainable farming techniques - and require training accordingly – their willingness to engage in education will be facilitated by a better understanding of the extent of the problem they are being asked to solve.

There is also a prevailing view that the correct conditions are not in place to enable consumer demand for high environment, high animal welfare dairy production. Italian SPI participants in particular refer to a lack of public understanding around the positive role traditional dairy farming systems can have on alpine landscapes, local traditions, and culture. There is also a strong belief across the SPIs that consumers are confused with current product labelling systems. This prevents product differentiation and exacerbates the potential for greenwashing.

Interventions

Develop collaborative dialogue

A very clear recommendation made by SPI participants relates to the need for cross sector collaboration involving all members of the dairy value chain. A strong role is envisaged here for government as the facilitator of this process. For example, Spanish SPI participants refer to a need for a ‘dialogue table’ involving national and regional policy-makers from agricultural and environmental departments meeting with representatives from the value chain. It is noteworthy that SPI participants

in all case study regions anticipate challenges with coordinating competences across different public sector administrative jurisdictions and actors. SPI participants in Italy envisage a need for farming representatives to be more open which may require a change in the governance of farming consortiums where limited self-criticism, fear of exposure and self-interest can be strongly entrenched characteristics. Italian SPI participants suggest charismatic leaders will be needed to help producers develop a common vision for a production strategy consistent with economic, social and environmental sustainability.

Developing correct market conditions to reward sustainable dairy production

SPI participants made a number of recommendations regarding creating a market for sustainably produced dairy products. This is a challenging topic and will require multiple interventions to bring about changes in consumer buying behaviour. Italian SPI respondents focus on a need for school level education to promote awareness of pro-environmental dairy systems (they mentioned the 'alpi-cultural model' model in particular), supported by appropriate policies at both a national and local level. SPI recommendations in Italy also stress a need to expand the tourist market, through incentivising tourism facilities that use local products. Local collaboration between a small number of businesses to pilot and trial such a strategy is suggested as a sensible way forward. Training will be required for farmers and stakeholders operating within the tourism sector to successfully promote the the alpi-cultural model. In our Spanish SPI, participants concentrate more on the role of regulation to achieve sustainable dairy market demand. For them, mandatory environmental labelling standards should be introduced across Europe (instigated by the EU) which would help the valorisation of pro-environmental performance by farmers, for example in carbon reduction. Through this mechanism, a business opportunity will be created for dairy farmers wishing to take steps to adapt their farming systems. Spanish SPI participants also suggest regulations are required to control fraud in product labelling to avoid greenwashing and consumer confusion. Regulation will need to be accompanied by effective enforcement and inspection protocols administered by government.

Upskilling farming community and awareness raising

There is now a plethora of analysis within the agri-environmental policy literature highlighting that a transition in agricultural production systems will require significant training and advice provision to be delivered to the farming community. SPI dialogue is very much in line with this position, outlining a number of suggested interventions. Spanish SPI participants see multi-level education as important for the livestock sector, from master's degree level courses in environmental management through to more applied vocational education and training (VET) modules. Importantly, non-attendance modules should be made available for active technicians, given members of the agricultural community 'on-the-ground' are often very time poor. In addition, SPI participants in Spain mention a need for pilot farms to demonstrate new ideas and techniques in practice. In many cases, seeing is believing for members of the farming community. It is the view of our Spanish SPI participants that both the government (regional agricultural departments) and farming cooperative federations have a role to play in delivering any future knowledge transfer programme. They also suggest that dairy cooperatives should take responsibility for raising awareness among livestock farmers of the need to transform the production system. There was a very interesting discussion within our Spanish SPI around a need for sensitivity when promoting a need for change from the farming community. Many farmers feel undervalued within society, poorly remunerated economically, ideologically under attack and unfairly blamed for what they see as a societal food system problem which is not the sole responsibility of the farming industry.

Our Italian SPI participants also stress a need for improved education and training. For them, use of information technology is seen as important. For example, it is suggested a useful innovation would

be the creation of a digital platform to better understand the supply-demand flows of organic manure. This could be promoted through producer organisations with care taken to ensure the platform is user-friendly and accessible to farmers. A need for accredited education standards (professional standard) is also judged to be important. For example, relating to animal welfare, it is felt farmers should strive to obtain certification from a recognised authority such as the National Reference Centre for Animal Welfare (CReNBA).

Data monitoring & interpretation capacity

SPI dialogue has stressed the need for clear and transparent standards governing environmental performance of food products, driven by evidence-based science. Our SPI participants in Spain have helpfully articulated a number of clear interventions for the dairy sector which have relevance for other food categories. At an international level, a scientific committee should be established to oversee and define parameters to be measured (including their values) and measurement techniques. The aim should be to create a European standard to enable a level playing field. A Centre for the evaluation of technologies should be established, tailored to the needs of individual country models, the idea being to develop a database of Best Available Techniques ('BAT'). In addition, innovation projects should be organised for different production models to evaluate specific outcomes (e.g. carbon sequestration in soils) and support should be put in place for farm monitoring. Delivery of such a programme will require collaboration from EU to local level public and private organisations, academic institutes, sector groups and farming associations.

Infrastructure and organisational capacity

It was the opinion of SPI participants that delivering sustainable dairy production will also require investment in infrastructure (technology) and organisational capacity particularly at the primary production end of the supply chain. For example, our Italian SPI participants regard the creation of an efficient web of biogas plants (co-ordinated by producer organisations) to be a key component in a sustainable dairy industry going forward. This will help to provide a solution to nutrient leaching and will create a renewable source of heat and power within the rural economy. Installation of photovoltaic panels on roofs and non-productive (abandoned) land will also contribute to carbon emission reductions from dairy farms. To help with animal welfare concerns regarding heat stress caused by rising temperatures, the use of heat sensors and monitoring systems to cross-check real time data is advocated. Investment in different livestock breeds and genetic improvements is also cited as a solution to animal welfare challenges.

Interventions to improve organisational capacity mainly focus on novel solutions to manure management. In particular, Italian SPI participants favour the establishment of new cooperative ventures to manage the storage, transfer and spreading of manure from dairy farms to other local supply chains (e.g. the grape and apple sector). This would be accompanied by a protocol of self-discipline within the diary industry whereby a set level of organic fertiliser from the dairy supply chain would be repurposed to other sectors where a nutrient deficiency exists.

Developing sustainable water resources management plans involving multiple food producers

Water scarcity on the one hand, punctuated by flooding events on the other, are already amongst the largest natural resource management challenges facing all countries across Europe. Food producers are often significant users of water, particularly those employing irrigation systems which is relevant to the water scarcity challenge. Farm management practices can also contribute to the severity of flood events, for example through inappropriate drainage and soil management practices. Conversely, farmland also has a huge ability to attenuate rainfall, thereby helping to mitigate flood risk by reducing peaks in the hydrograph in downstream watercourses. In addition, farmland can be managed to

absorb water in times of plenty, thereby increasing availability in times of scarcity. To add to the complexity, how water is used and managed in one part of a hydrological river catchment affects users and downstream communities in other parts of the catchment. For this reason, sustainable water management requires sustainable land management at a hydrological catchment scale which in nearly all cases transects multiple landholdings.

The corollary of all this means a sustainable food system requires the creation of collaborative water management strategies involving multiple stakeholders, often with different needs and priorities. Successful implementation of such strategies has proved a significant challenge globally. Our Hungarian partner has established an SPI community specifically to explore this topic in detail within the context of a European catchment area.

Diagnosis of the barriers

SPI participants largely agree there is a crucial need for a shared vision on how Hungary will manage its landscape and water bodies over the next 50 years. A number of barriers to achieving this aim are identified. As in many countries, political rather than economic interests frequently influence irrigation policy decisions. Besides a lack of political will, there is a shortage of younger and forward-thinking farmers who are open to change. It has long been known that water shortages are anticipated and that maize production will not be possible or very risky in the near future. Yet the so-called 'Hungarian trinity' land use pattern (the dominant arable crops of wheat, maize, and sunflower) remains unchanged.

In Hungary, there are examples of existing irrigation communities brought together to manage water resources collectively. However, in many cases, these communities have only come into being due to the existence of subsidies which are no longer available within the CAP programming funding period (CAP Strategic Plan). The fate of many of these communities is therefore uncertain.

Maintaining and operating existing infrastructure has often been difficult due to complex ownership structures. Neglected water management infrastructure is increasingly unable to cope with situations of water scarcity and abundance. To compound the challenge, the annual governmental budget for water management is now significantly reduced. Irrigation communities have historically been established within administrative or social/family jurisdictions, not hydrological catchment boundaries which is not ecologically desirable. And furthermore, regarding the use of groundwater, there are no reliable statistics on the number of wells in existence and usage volume. No one is monitoring the drilling companies.

Interventions

Restructuring governmental administration and decision making

As with so many of the other food system related topics our Visionary SPI groupings are looking at, SPI participants in Hungary identify a lack of cohesion and connection of responsibilities within government concerning the management of water resources. They believe a necessary intervention going forward will be the creation of a new ‘Ministry of Water Resources’ to enable integration of water management to happen. This department should incorporate nature conservation to enable a synthesis between conservation and farming objectives, it should have clearly defined budgets and should assume responsibility for the management of water infrastructure assets.

SPI participants in Hungary also recommend the creation of a comprehensive water management strategy (to define goals and priorities) and conceptual framework in conjunction with multiple government departments including the Ministry of Agriculture, Ministry of Interior, Ministry of Finance, Ministry of Energy & NAK (The Hungarian Chamber of Agriculture). International experience

strongly indicates that the horizontal and vertical integration of different government departments is very challenging.

Introducing more and stronger regulations

SPI dialogue in Hungary clearly identifies a significant role for the state to set appropriate regulatory instruments to govern water management and usage. Suggested regulations are extensive and wide ranging and include the introduction of energy certificates for irrigation equipment, prescribing statutory consultation with professional stakeholders, mandating the measurement of water efficiency, the creation of a unified platform for water management records and introducing real-time water management data reporting.

Hungarian SPI participants also stress a need for the state to intervene in determining the water price-value ratio. Associated with this objective would be a move to mandate water metering in the case of groundwater extraction (e.g. smart meters), re-regulation of water prices/water quotas or quota trading and the introduction of water use standards.

Enabling 'mindset transformation'

An interesting conclusion from the SPI dialogue in Hungary is a need to shift normative thinking in the way stakeholders address natural resource management challenges relating to water. Thinking is still compartmentalised and technocratic and does not fully recognise the complex spatial and temporal variables governing sustainable water use. SPI participants call for leadership from multiple government departments to initiate water management interventions specified in the EU Commission's Recovery and Resilience Facility, systematic development of the curriculum related to water management (ensuring synergy between agriculture and water management) and the expansion of field exercises and research.

Section 2 – Insights from the policy and regulatory mapping exercise

Introduction

The VISIONARY research team has selected a wide range of case studies, identified as examples of initiatives that have potential to deliver sustainable food system outcomes. These case studies have been grouped into five thematic clusters: biodiversity delivery; organic farming; value chain; plant-based protein; and water resources management. For each case study, a mapping exercise has been undertaken to screen and analyse regulatory and policy tools considered relevant to enabling or hindering the initiative under consideration. In particular, these interventions have been identified by the research team and external experts as having relevance to the conditioning of food actor behaviours.

A total of 94 policy tools have been selected, corresponding to the five thematic clusters. The following table summarizes the number of tools presented, by thematic cluster and country.

Table 2. Summary of policy mapping reports

Thematic cluster	Number of tools	Participating countries
Organic farming	19	UK, Germany, Poland, Hungary, Spain
Biodiversity	19	UK, Germany, Poland, Spain
Climate	4	Italy, Denmark, Spain
Water	6	Denmark, Hungary, Spain
Plant-based protein	11	Denmark, Germany, Poland, Spain
Value chain	35	Germany, Poland, Hungary, Spain, Romania, UK, Denmark

The selection includes both current and consolidated policy tools and new to-be-implemented instruments. This latter group contains interventions proposed in ongoing policy processes at both the EU and the national levels (e.g. legislative proposals or national strategies) that will be implemented in the near future.

The identification and selection of tools was carried out between April-December 2023 by combining VISIONARY team expertise in the field, preliminary in-depth interviews with experts and information gathered in the multi-actor workshops undertaken with SPI participants.

The selection process for each case study did not aim to compile all the tools in the whole (multilevel, multi-sectoral, overlapped) regulatory and policy framework that conditions food actors' decision-making. There are many institutional factors constraining, affecting or enabling farmers, processors, retailers, or consumer practices. In line with the project's main objectives, the selection aim was to identify a set of key policy interventions, particularly relevant in shaping actors' behaviour, on which to focus discussions within the SPIs and to shape the design of the experimental research to be undertaken within the project.

Hence, readers should note that the frequency or number of policy tools reported cannot be considered statistically significant or representative for inference or extrapolation. Instead, they represent the dominant approaches adopted by policymakers to address the multiple faces of the sustainable food transition in the case study domains.

Characterization of the policy tools

To carry out the policy mapping, a set of characteristics was compiled to describe each policy tool. Collecting the same items for each tool has allowed the project team to make comparisons within each case study, country and overall. Moreover, the characteristics have enabled a consideration of the hybridity and interdependency of policy instruments.

Each tool submitted for analysis was described by filling in a fiche (see Appendix 1). The information collated can be categorised into three sections:

1) Qualitative description of the tool: including its objectives, rationale and means of implementation. This includes a description of how the tool conditions actors' decision-making relating to the environmental issue under analysis. Also, the relationship with other tools, be it complementary or contradictory. If the tool has already been implemented, a preliminary assessment of results (if available) was requested.
2) The policy frame is about the policy/legal frame where the tool is situated. Very often, policy tools are included in a wider legal framework that conditions its rationale, design, and implementation.
3) Detail on the tool. The focus of this section is to identify how an instrument conditions the behaviour of its target population. This includes identifying the funding allocated, the target group, the geographical coverage and the domain of application e.g. food system-wide or farming system only. In addition to these elements, a crucial piece of information collated within this section relates to the behavioural assumption underlying the design of the tool. In keeping with the initial conceptual framework developed for the VISIONARY project, the following six categories were used: direct regulation, economic incentives or disincentives, public infrastructures, moral suasion, capacity tools or boosts and nudges.

Each of these categories can be defined as follows:

- Direct regulation: places a restriction or introduces rules that force compliance or make specific options unavailable. Includes bans, obligations, standards. They are linked to penalties (from fines to conviction in courts).
- Economic incentives: aim to promote a given behaviour (which is voluntary) by providing incentives (monetary, time, other resources), based on a cost-benefit analysis carried out by the policy subjects. Include tax reliefs and environmental payment. An assumption by public agencies of centralised transaction costs to ease certain decisions (e.g. public certification schemes). Also, the opportunity to sell tradable environmental permits.
- Economic disincentives: try to discourage a given behaviour (which is voluntary) by providing disincentives (monetary, time, other resources), based on a cost-benefit analysis carried out by the policy subjects. Examples include taxation and charges and the obligation to buy environmental permits.
- Public infrastructure: focuses on providing means and opportunities for desirable behaviour, assuming that policy addressees will use them. Examples are roads, facilities or buildings.
- Moral suasion: tries to provide compelling reasons to comply. These tools assume that people are motivated from within and decide whether or not to take policy-related actions based on their beliefs and values.
- Capacity tools/boosts: provision of information, training, education, and knowledge to enable individuals or groups to make decisions or carry out activities.
- Nudge: steers individuals' behaviour in a predictable way by exploiting cognitive shortcomings in human deliberation and choice, without changing financial (dis)incentives. A nudge does not affect those features over which people have explicit preferences (e.g., money, convenience,

taste, status, etc.) but rather those features that people typically claim not to care about (e.g., position in a list, default options, framing).

Overview of the case studies and tools

An overview of the types of policy tools identified and the main target populations can be found in Figures 1 and 2 respectively.

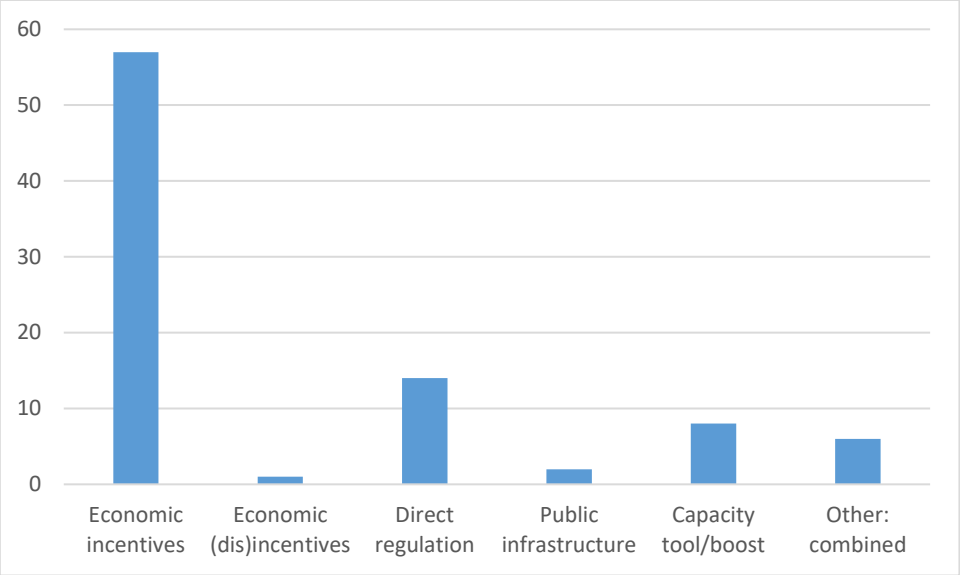

Figure 2. Classification of selected policy tools by intervention type (number)

Note: Only in 4 cases the nudges and the moral suasions tools are reported, all of them in combination with other types

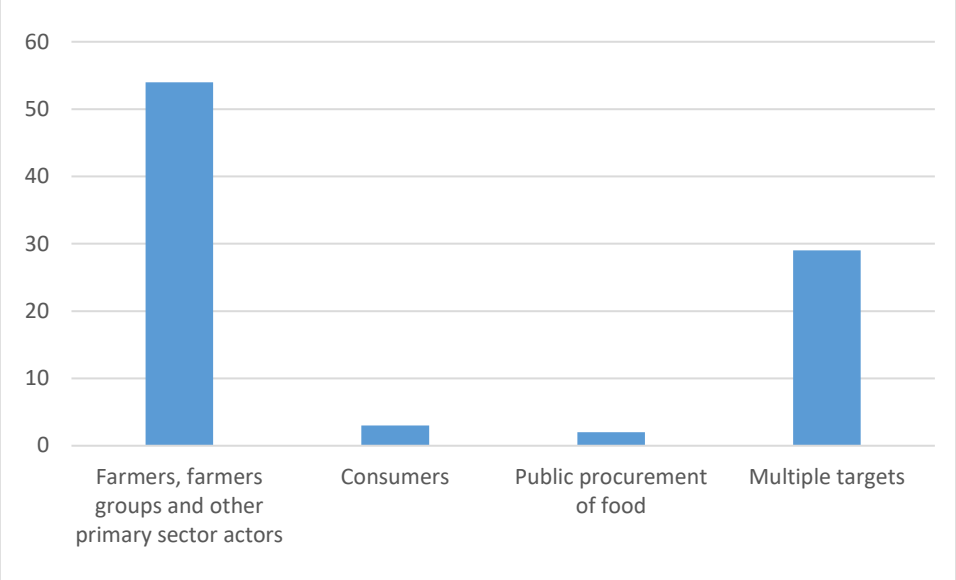

Figure 3. Classification of selected policy tools by target population (number)

Note: Very often, the "Multiple targets" category is composed of measures targeting simultaneously several agents of the food value chain, from farmers to consumers

A more detailed explanation of how these policy tools operate in the various thematic clusters is tackled in the following section. In overview, the figures show the dominance of positive economic incentives in the selection with more than half of the identified policy tools addressing farmers and other agricultural actors (agricultural cooperatives, groups of producers).

Review of tools by thematic cluster

Transition to organic farming

Table 3. Policy tools: transition to organic farming

Participating countries	DE, UK, HU, PL, ES*
Number of policy tools reported	Direct regulations: 2 Economic incentives: 11 Capacity tool/Boost: 4 Moral suasion/ Nudge: 2

* One of the Spanish case studies is part of the thematic cluster on collective water management. However, the focus is on the adoption of organic farming in irrigated districts, so it has been also included in this section.

The increase in the area devoted to organic farming is a key aim of European agricultural policies. In the case of the EU, this is clearly stated in the 'Farm to Fork Strategy", which sets up the objective of at least 25% of the EU's agricultural land under organic farming by 2030.[2] The fact that the mainstreaming of organic farming has become an objective nationally, explains the relatively high number and diversity of policy tools reported under this heading. Moreover, organic farming and the related policy interventions have been identified as relevant in other VISIONARY thematic clusters (plant-based protein transition, short food value chain initiatives, or collective water management). Contrary to other thematic clusters in which the interventions selected are targeted at a specific type of population (farmers in most of the cases), organic-related interventions address a diversity of food operators (including processors and retailers). These two last points show the cross-cutting nature to organic food and farming.

Most policy tools are economic incentives, many of them in the form of eco-schemes, agri-environmental payments and organic payments[3], all of them directly to farmers. Most of these payments are included in the CAP, but there are similar tools in other national-funded policies. In other cases, these incentives have a value chain approach, allowing other food actors to benefit from the incentives.

Capacity tools also form a part of the compilation. This shows that, despite being a consolidated frame, policy makers regard the extension of organic farming as requiring the improvement of actors' knowledge and skills.

Biodiversity

Table 4. Policy tools: biodiversity

Participating countries	DE, UK, PL, ES
Number of policy tools reported	Direct regulations: 2

[2] Nations in the UK set their own targets: Scotland: double the amount of land under organic management by 2026 (to approx. 3.6%). England (unofficial): 10% of land under organic (tripling the current 3.3%).

[3] Note these are mutually exclusive in some countries; the impossibility of combining organic schemes with other schemes triggers a lack of comparative advantage and attractiveness for organic farming in e.g. Germany and Spain (IFOAM report: https://www.organicseurope.bio/content/uploads/2022/03/IFOAMEU_CAP_SP_feedback_20220303_final.pdf?dd)

	Economic incentives: 14 Capacity tool/Boost: 2 Moral suasion/ Nudge: 1

Interestingly, a few biodiversity-related direct regulations conditioning farmers' decision-making were identified, limited to those operating in natural protected areas (e.g. Natura 2000 sites). Although it has not yet been implemented, the EU Nature Restoration Law has been pointed out as a major future milestone regarding its impact on land managers' practices.

As for economic incentives, the selection of policy tools in EU countries -to some extent also the UK- goes along a range of interventions included in the CAP. Firstly, the basic payment scheme and other direct payments like the Less Favoured Areas (LFA) support scheme are subject to compliance with biodiversity protection requirements. This represents a hybrid policy tool -between an incentive and a direct regulation - as farmers are paid for complying with various ecological requirements. Secondly, CAP first pillar eco-schemes have received, despite their recent implementation, attention for their capacity to shape farmers' practices. Thirdly, agri-environmental schemes keep being a well-established intervention regarding farm biodiversity.

Finally, Moral suasion/Nudge was mentioned as part of the "Scottish Biodiversity Strategy to 2045". The contents of the strategy are yet to be implemented, but our research team in Scotland emphasises how the strategy aims to change the dominant narrative of what biodiversity conservation means in terms of economic development and opportunities.

Climate

Table 5. Policy tools: carbon farming

Participating countries	IT, DK, ES*
Number of policy tools reported	Economic incentives: 4

* The Spanish case study is part of the thematic cluster on value chain analysis. However, the focus is on carbon certification and mitigation strategies in the dairy sector, so it has been included in this section of the report.

Carbon farming is a relatively recent concept in the European policy context, so the policy tools reported by our research teams mostly include interventions and approaches that are currently being introduced (e.g. dedicated eco-schemes under the first pillar of the CAP 2023-27) or are yet to be initiated. Regarding policy interventions that are not yet fully implemented, result-based agri-environmental and climate schemes have been identified. This is a modality of scheme application that is, as yet, barely used in the domain of the CAP, despite its alleged advantages. The extension of this approach has the potential to make a difference to farmers' adoption of carbon payments. Similarly, the future EU Regulation establishing a certification framework for carbon removals has been pointed out as a key step in consolidating the opportunities stemming from the current private carbon offsetting programmes and carbon markets.

Collective agricultural water management

Table 6. Policy tools: collective agricultural water management

Participating countries	DK, ES, HU
Number of policy tools reported	Direct regulations: 6 Economic incentives: 3 Capacity tool/Boost: 1

The policy tools identified by the research teams participating in this thematic cluster reflects the dual nature of the objectives of improving agricultural water management: quality and quantity. Each of these two approaches is aligned with a specific set of tools. For quality objectives, direct regulations prevail, although they are associated in a few cases with economic incentives. Regarding quantity, public policies addressing agricultural water management are mostly based on support for physical infrastructures, allowing farmers to access and increase water use efficiency by means of new irrigation systems. These interventions usually require high budgets, so national and regional administrations frame these investments in the EU policies, namely interventions funded by the European Agricultural Fund for Rural Development (EAFRD).

Plant-based protein transition

Table 7. Policy tools: plant-based protein transition

Participating countries	DE, PL, DK, ES
Number of policy tools reported	Economic incentives: 8 Economic disincentives: 1 Capacity tool/Boost/Moral suasion: 2

The policy tools selected to trigger the transition towards a plant-based protein food system clearly distinguish two domains. Firstly, there are economic incentives linked to promoting the expansion of the cultivation of protein crops. Most of these incentives are funded under several CAP interventions by means of coupled payments and eco-schemes for these crops. In addition, some national payment schemes are included in this selection. Secondly, on the consumption side, policy support exists associated with capacity and moral suasion tools. Some consumption interventions are still to be implemented (e.g. climate label) or are just under debate (taxation), showing the emerging nature of this policy arena.

Value chain

Table 8. Policy tools: value chain

Participating countries	UK, RO, PL, ES, DE, HU, DK
Number of policy tools reported	Direct regulations: 8 Economic incentives: 21 Capacity tool/Boost: 6

The value chain thematic cluster includes a diversity of case studies that are, in part, complementary to other studies implemented in other clusters (e.g. carbon, water, organic or plant-based). Some of the cases included in this cluster revolve around the creation and/or consolidation of local food supply chains, in which sustainability aspects gain relevance in explaining actors' practices. In this regard, two main groups of interventions have been highlighted to be particularly relevant. Firstly, those supporting norms and standards regulating food hygiene and safety, in particular in the processing and retailing stages, are critical in these (local) proximity markets, where small-scale businesses (and frequently informal transactions) prevail. Secondly, there are a diversity of economic incentives aimed at supporting the necessary investments in setting up the facilities needed for these local supply chains. This support comes in several cases from the tools included in the second pillar of the CAP (including the LEADER intervention). In addition, capacity tools/boosts have been included in the selection, showing the necessity to improve the information and skills of participants in these local supply chains on both the supply and the demand sides (e.g providing additional information to consumers using labels and certifications).

Summary observations

The landscape in which food actors (from producers to consumers) make their long- and short-term decisions and choices is made up of a great number of multilevel and multi-sectoral set of policy and regulatory frameworks. These frameworks define a 'policy mix' of unclear boundaries and a plethora of tool combinations that condition actors' behaviour. Within this constellation of interventions, the regulatory and policy mapping undertaken by the VISIONARY team has aimed to distil, for each case study and country, those that are particularly relevant to either explaining current actors' behaviour or being able to potentially change that behaviour.

From the analysis conducted, we can derive some summary observations that are of relevance to the project, both in terms of the interventions to be tested in the experiments and to be used as the focus of discussions in the SPIs.

A majority of the selected policy tools are classified as 'economic incentives'. A preliminary interpretation of this is that, very often, enhanced ecological food practices are considered to go beyond obligatory standards, so voluntary uptake needs to be promoted by means of compensating income foregone and incentivizing those actions. Secondly, this also reflects a position where sustainable food and farming practices are often associated with an economic burden that requires compensation not to lose market competitiveness. Finally, the employment of traditional economic incentives (payments for farm practices, financial support to projects or cooperation) together with the almost non-existent use of behavioural interventions (e.g. nudges) shows the difficulties that governments face in incorporating more innovative approaches.

In most of the selected countries, these economic incentives are found under the framework of the Common Agricultural Policy, in both Pillar I (direct payments and market interventions) and Pillar II (rural development), funded respectively by the European Agricultural Guarantee Fund, and the European Agricultural Fund for Rural Development. Some countries have also reported interventions funded under the EU Next Generation framework. In the case of the UK, economic incentives are, framed in national policies, but their rationale and approach are clear heirs of the CAP mechanism.

Very few behavioural interventions (boosts, nudges) have been found and reported, illustrating that these policy tools are still in their infancy. Moreover, these few examples are almost exclusively targeted at consumers. There is a need to enrich the use of these behavioural tools in the context of other target populations.

The mapping exercise undertaken has also shed light on the way tools are targeted individually (i.e. individual beneficiaries of the economic incentives, or laws regulating individual behaviour) or collectively (i.e. requiring coordination and collective uptake). More than half of the tools have been classified as individual, and some can be applied individually or collectively. Exclusively collective tools are mostly found in the value chain cluster. This reflects the necessity of coordination, sometimes by a few participants operating at the local level with the aim to shape more sustainable shorter supply chains, and in other cases in a broader context e.g. those based on the establishment of labelling schemes.

Some of the policy tools have a hybrid nature, as they span traditional categorisations and are neither purely direct regulation, economic or informational, obligatory or voluntary[4]. As mentioned above, this is the case with some interventions included in the CAP (e.g. direct payments subjected to good agri-environmental practices, eco-schemes). This is interesting as they occupy an intermediate position

[4] Blackstock, K. L., Novo, P., Byg, A., Creaney, R., Bourke, A. J., Maxwell, J. L., ... & Waylen, K. A., 2021. Policy instruments for environmental public goods: Interdependencies and hybridity. Land Use Policy, 107, 104709.

between obligatory direct regulations and purely voluntary agri-environmental and climate schemes. Together, they shape a 'gradient' of modalities of intervention along which farmers' (and policy-makers') perceptions vary, regarding their voluntarism/obligation, lower/higher level of required changes in farming practices, and even their degree of legitimacy in relation with farmers' vested rights. The dynamic character of this gradient of tools is also relevant, as one can see how, over time, certain environmental requirements or standards are changing from one tool to another, i.e. when voluntary green payment modalities become, years later, obligatory standards necessary to access CAP payments.

Section 3 – An overview of contemporary policy dynamics of relevance to the VISIONARY project

Introduction

We are now witnessing a decisive moment in the evolution of European food systems, where the need to justly balance food security, environmental sustainability, and economic prosperity has never been more crucial.

Diverse and simultaneous challenges are affecting the resilience and sustainability of European food systems throughout the entire chain, such as climate change, resource scarcity, biodiversity losses, pollution, increased urbanisation and disconnection between rural and urban areas, unsustainable business models in the agri-food sector, ageing population, current consumption patterns (including unhealthy food consumption contributing to an increase in non-communicable diseases), triple burden of malnutrition (undernutrition, overnutrition and hidden hunger – micronutrient deficiency) food waste and unequal access to and insecurity of food[5].

Furthermore, the impact of the challenges mentioned above is accentuated by the tensions in the international socio-economic context, marked by the COVID-19 crisis, geopolitical uncertainties (war in Ukraine, rise in populism, to name a few), economic and energy crises (including the rise in food prices which is directly impacting consumer purchase choices, as well as the financial viability of the small and medium enterprises in the agri-food sector) and climate change[6]. These current shocks and stresses highlight the interrelations within the European food system, together with the importance of strengthening the resilience of the food system to uncertainties and shocks while balancing food security, environmental sustainability, and economic prosperity. In the current setting, there is a particular need to consider the increasing spread of misinformation, loss of trust in expertise and increased anxiety concerning the future, which characterise European society at the current moment[7].

A sustainable food system is a food system that delivers food security and nutrition for all in such a way that the economic, social, and environmental bases to generate food security and nutrition for future generations are not compromised[8]. The importance of food systems has been recognized by António Guterres, UN Secretary-General, who highlighted that 'food systems hold the power to realize our shared vision for a better world'. However, it is widely acknowledged that we need a collective effort to contribute to the sustainability and resilience of the European food system, ensure our well-being, and secure future generations' well-being.

Consequently, there is a concern among European legislative bodies to strengthen the resilience and improve the sustainability of the food system. To achieve these goals, the European Union has devised a series of policy responses. These are listed below together with paraphrased descriptions derived from relevant EU literature sources:

[5] A 'Common Food Policy' for Europe: How governance reforms can spark a shift to healthy diets and sustainable food systems, Olivier de Schutter, Nick Jacobs, Chantal Clément, 2020. https://www.sciencedirect.com/science/article/abs/pii/S0306919220300336

[6] Sustainable Food Systems, Partnership for People, Planet and Climate, SRIA, SCAR, 2023. https://scar-europe.org/images/FOOD/Main_actions/SFS_Partnership_SRIA_31012023.pdf

[7] Food 2030 pathways for action, EC, 2023. https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1

[8] Sustainable food systems. Concept and framework, FAO, 2018. https://www.fao.org/3/ca2079en/CA2079EN.pdf

1. The Green Deal[9] represents the framework for transforming the EU into a fair and prosperous society with a modern, resource-efficient, and competitive economy where there are no net emissions of greenhouse gases in 2050 and economic growth is decoupled from resource use. It considers the importance of using a holistic and cross-sectoral approach, including initiatives covering the climate, the environment, energy, transport, industry, agriculture, and sustainable finance – all of which are strongly interlinked.
2. The Farm to Fork Strategy[10] attempts to address the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet.
3. The Food2030 Pathways for Action[11] is a vision and policy framework based on the premise that a well-governed and more systemic R&I policy can develop more impactful solutions to the complex and interconnected challenges inherent to food systems that need urgent transformation to respect planetary boundaries; provide healthy, safe and nutritious food and diets for all, and; sustain a diverse, fair, inclusive and thriving food economy.
4. The Biodiversity strategy for 2030[12] is a key pillar of the European Green Deal and aims to protect nature and reverse the degradation of natural ecosystems. It promotes green recovery in a post-pandemic world while restoring biodiversity for the benefit of the people, climate and planet.

To tackle the challenges mentioned above, the EU is also highlighting the importance of investing in research and innovation projects. Currently, the Food2030 platform unites 75 EU research projects to pursue a more interconnected approach to transforming food systems. These 75 projects cover a diversity of food systems sustainability topics:

- Reducing food loss and waste across the food value chain.
- Developing localized food systems and short food supply chains.
- Optimizing the efficiency and sustainability of future food production.
- Ensuring a just transition that is fair for both farmers and consumers.
- Contributing to citizen-driven and city-led food system transformation.
- Learning and knowledge sharing for supporting food system transition.
- Plant-based food production and consumption.

There follows a general overview of the dynamics of contemporary policies at the EU level of particular relevance to the VISIONARY project, focusing on three main policy areas:

- The post-2027 Common Agricultural Policy (CAP)
- The EU Sustainable Food Systems Framework
- The Nature Restoration Law

Also included is a summary of the policy framework in England and Scotland which include many parrallels with the EU direction of travel.

Post-2027 Common Agricultural Policy (CAP)[13]

The Common Agricultural Policy (CAP) is the oldest EU policy still in operation, with a history of implementation of over six decades. Developed initially as a set of laws that provided a unified policy

[9]The European Green Deal, EC, 2019. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[10] Farm to Fork strategy, EC, 2020. https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
[11] Food 2030 pathways for action, EC, 2023. https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1
[12] Biodiversity strategy for 2030, EC, 2020. https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en
[13] This section has been elaborated using the Sources detailed in Appendix 2 – Box 1.

on agriculture, the policy has adapted over the years to the new challenges faced by European agriculture: ensuring food security for the European population, addressing global market fluctuations and price volatility, maintaining thriving rural areas across the EU, using natural resources more sustainably and contributing to climate change mitigation. The CAP aims to provide affordable, safe, and high-quality food for EU citizens while ensuring a fair standard of living for farmers, preserving natural resources, and respecting the environment.

The Common Agricultural Policy consists of two pillars and three main areas of action:

1) **Direct payments (first pillar)** – area-based payments that are granted to farmers to support them in continuing their farming activities, whilst encouraging them to comply with all relevant food safety, environmental and animal welfare requirements
2) **Market measures (first pillar)** – specific sectoral measures developed to counterbalance the challenges that agri-food businesses face, such as global competition, geopolitical, economic, and financial crises, climate change and volatility of input costs
3) **Rural development (second pillar)** – introduced in 1999, this policy tool supports the sustainable development of the EU's rural areas and agriculture by contributing to modernising farms, boosting rural areas, increasing the competitiveness of the agricultural sector, protecting the environment, and mitigating climate change, ensuring generational renewal, and improving the vitality of rural communities

The CAP is one of the most dynamic EU policies, going through successive reforms to adapt to the internal and external pressures faced by European agriculture. The history of the CAP can be divided into three phases that broadly reflect society's changing relationship with farmers: the **pioneering phase** to supply food to post-war Europe, **the reform phase** due to over-production and negative impacts upon Developing Countries, and the current third phase **of reconciliation** between public support for farmers and social and environmental concerns about modern farming methods.

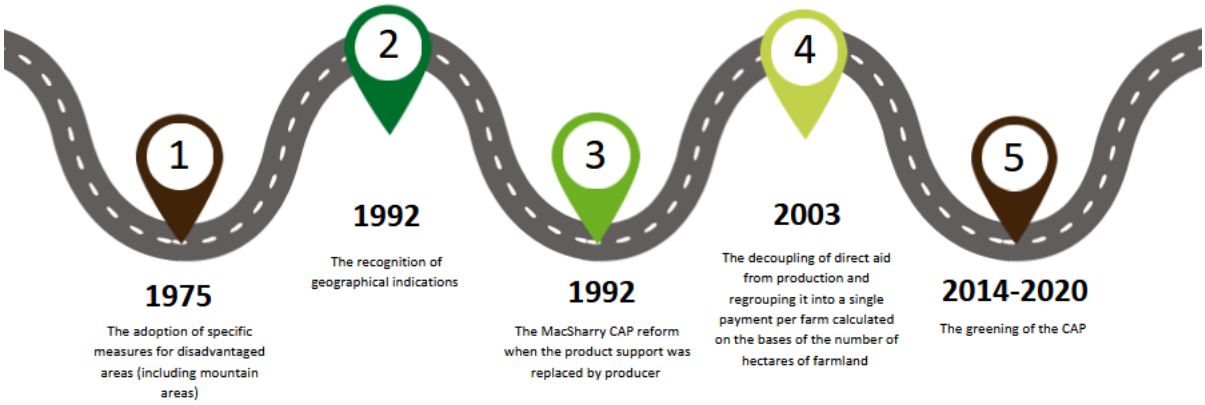

Figure 4. Major reforms of the CAP (own elaboration from [14] and [15])

The CAP remains a controversial policy, with many lobby groups influencing the pace and direction of reforms. The current CAP 2023-2027 introduced provision for a series of potential improvements (contribution of the agricultural sector to environmental and climate goals and more targeted support to smaller farms) while trying to simplify the management of the policy for both farmers and administrators. The objective has also been to offer greater flexibility for EU Member States in

[14] Challenges facing the CAP over the next decade, Bernard Bourget (Fondation Robert Schumann), 2020. https://server.www.robert-schuman.eu/storage/en/doc/questions-d-europe/qe-547-en.pdf
[15] CAP post-2027: An Integrated Rural and Agricultural Policy – Part 1, Mathieu Willard (Arc2020), 2023. https://www.arc2020.eu/cap-post-2027-an-integrated-rural-and-agricultural-policy-part-1/

adapting measures to local conditions in the form of a single National CAP Strategic Plan that integrates both Pillar 1 (European Agricultural Guarantee Fund - EAGF) and Pillar 2 (European Agricultural Fund for Rural Development - EAFRD) interventions.

Regarding budget, there has been a trend of reducing EU expenditure on the CAP over the last 40 years (from 65.5% of the EU budget in 1985 to less than 25% in 2021)[16] and the departure of the United Kingdom from the EU, the CAP budget is expected to be further reduced in the next EU multi-annual financial framework. Therefore, the policy will face a difficult reality: having to address a wider range of issues raised by consumers and citizens, whilst balancing farmers' well-being and environmental concerns with a diminishing budget.

Direct payments were first introduced as a compensation measure to farmers for their reduction in income due to lower market prices. The European Commission considers them to play a crucial role in providing a basic income for the farmers, as well as lending additional support for compliance with higher environmental, food safety and animal welfare standards. Direct payments are also considered important because (with appropriate conditionality attached) they ensure the provision of public goods. However, in reality, the situation differs greatly from these theoretical good intentions. Firstly, the initial reason for introducing direct payments in the CAP is no longer existent in the current context (and the new Member States were never affected by that situation). Secondly, since direct payments are dependent on the farmland size, in most cases it benefits the larger farms, with high levels of income, and not the smaller and medium-sized farms that need this type of support. Moreover, the situation becomes even more complicated when we consider that, in many cases, farmland is rented. In these situations, financial support benefits can sometimes accrue to the landlord and not the tenant who is continuing the agricultural activity in the area and safeguarding the public goods.

For these reasons and in order to develop a more efficient CAP, multiple solutions for reforming the direct payments component have been advanced into public consultations. Increasing the role of Pillar 2, including non-statutory agricultural and environmental practices in a simplified agri-environment-climate measure, developing a new fund under the CAP that will focus on sustainable land management and fair transition (which will entail a stronger role for environmental and climate authorities) are just a few of them.

Whilst these discussions continue, farmers feel under increasing pressure. Since 2019, there have been farmer protests across Europe, starting in the Netherlands and spreading to Ireland, Belgium, France, and Germany and reaching Central-Eastern Europe (Hungary, Poland, Romania). In the context of recovering from the COVID-19 pandemic and going through economic and energy crises, as well as the Ukraine war (which heavily impacts the agricultural sector in Central-Eastern Europe and polarises the society), farmers feel overburdened by the rules imposed by the European institutions. Many farming voices resist further restrictions and obligations imposed by the European Green Deal objectives and priorities (including the agricultural elements of the EU Farm to Fork and Biodiversity strategies).

Furthermore, farmers (especially large farms in the Netherlands and France) express frustration at what they see as a policy shift to produce less (after years of being told and supported to produce more). This situation needs to be effectively addressed, to avoid a worsening of the farmers' well-being (including their mental well-being).

[16]CAP expenditure: European Commission, DG Agriculture and Rural Development (Financial Report). EU expenditure: European Commission, DG BUDG (https://agriculture.ec.europa.eu/system/files/2022-11/cap-expenditure-graph1_en.pdf)

Internal discussions regarding the next CAP post-2027 started at the end of 2023, and official public consultations/debates regarding the future of the policy will commence in 2024.

EU Sustainable Food Systems Framework[17]

European food systems are facing a pivotal moment in their evolution, having to ensure food security for European citizens, economic prosperity for the business sector and environmental protection and climate change mitigation. The COVID-19 pandemic reinforced the unsustainable manner in which food is produced and consumed in Europe and reiterated the importance of thinking about and designing more sustainable approaches to food systems. It is also necessary to consider the external challenges that are making the shift towards a sustainable food system more difficult to achieve: tensions in the international socio-economic context, geopolitical uncertainties, economic and energy crises (including the rise in food prices which is directly impacting the consumer purchase choices).

To facilitate a sustainability transition across Europe, a set of policy initiatives have been developed over the last five years, starting with the European Green Deal. At the heart of the Green Deal stands the Sustainable Food Systems Framework (SFSF) within the Farm to Fork strategy. This sets out to act as a guiding framework instrument that coordinates and drives changes across the food systems as well as an operational tool within and across its different sectors. Its main objective is to accelerate and facilitate the transition that includes all actors in the value chain. A list of sub-objectives include raising awareness about the importance of food systems sustainability, development of a favourable enabling political and legal environment and easing the process of choosing healthy and sustainable diets.

Preparation of the SFSF began during 2021 with public consultations held in spring-summer 2022. 2,6670 entries were received, 77% from citizens, 11% from civil society representatives, 10% from the business sector and 2% from public authorities (1% - other). The summary of the public consultation responses highlight significant differences of opinion between citizens and civil society representatives on the one hand, and the business sector on the other. Whilst the large majority (91%) of the first category express a view that the current food system is not sustainable, only one-quarter of the business sector respondents have the same opinion. This gap in perception regarding the sustainability of our current food system may be one of the reasons why the evolution of the SFSF stalled in 2023, even though it was designed to be adopted by the end of the year.

As of January 2024, the SFSF has not yet been published and the proposal was not addressed in the EC President State of the Union speech in September 2023. In the EC 2024 work programme it is briefly mentioned that 'the Commission will launch a strategic dialogue on the future of agriculture in the EU, further engaging with farmers, stakeholders in the food chain and citizens, working together on the transition towards sustainable food systems'.[18] The reasons for this delay in publishing and/or adopting the SFSF remain unclear.

EU Nature Restoration Law (NRL)[19]

The EU Nature Restoration Law (NRL)[20] has been one of the most hotly disputed pillars of the European Green Deal in the last couple of years. The NRL is a key component of the Biodiversity Strategy and sets legally binding targets for Member States in order to restore degraded ecosystems. With 80% of European habitats classified in poor condition, the NRL aims for a 60% restoration of habitats in poor

[17] This section has been elaborated using the Sources detailed in Appendix 2 – Box 2.
[18] https://commission.europa.eu/system/files/2023-10/COM_2023_638_1_EN.pdf
[19] This section has been elaborated using the Sources detailed in Appendix 2 – Box 3.
[20] Nature restoration law, EC, 2020. https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en

condition by 2040 and at least 90% restoration by 2050. The proposal entails the following specific targets:

- Achieve targets based on existing legislation (for wetlands, forests, grasslands, rivers and lakes, heath and scrub, rocky habitats, and dunes): improving these habitats on a large scale and restoring the biodiversity in these areas.
- Stop and reverse the declining number of pollinators by 2030.
- Restoration of forests and improved biodiversity.
- Increasing green space in urban areas.
- Increasing the number of butterflies and farmland birds, as well as the percentage of agricultural land with high-diversity landscape. Restoration of drained peatlands that are currently used for agriculture.
- Restoration of marine habitats.
- Ensure that 25,000 km of rivers are restored to a free-flowing state by 2030.

The NRL has received its fair share of criticism, especially from farmers who fear that due to the restoration of drained peatlands they will lose valuable agricultural land. One of the biggest critics of the NRL has been a union of farmers who argue the law may endanger the livelihood of farmers and fishers and represents a danger to food security and availability within Europe. Despite these tensions, the law was provisionally agreed in November 2023. The next steps required are a final vote on NRL by the European Parliament in February 2024, followed by formal approval from every EU Member State. All EU countries will have to develop and submit their own National Restoration Plans to the EU Commission within two years of the NRL coming into force.

Policy framework and direction in England and Scotland

In the UK, the competencies and legislative powers for agriculture, environment, climate change, biodiversity and food are devolved to the four nations. Therefore, each nation has their own set of policies and strategies. Legacies of former EU membership are still visible but while the UK central Government wishes to make its own regulations, Scottish Government has taken powers to maintain dynamic alignment with European rules (for example in the Agriculture (Retained EU Law and Data) (Scotland) Act 2020). Broadly, the drive towards increasing the sustainability of agriculture and the agri-food system mirrors the ambitions of the EU. Key policies and strategies for England and Scotland are described below.

- England
    - Agriculture Act (2020) and Environment Act (2021) with legally binding targets
    - In the context of a post-Brexit and post-CAP United Kingdom, England's Department of Environment, Food and Rural Affairs (Defra) began in 2018 to develop a new system of agricultural support, entitled **Environmental Land Management (ELM)**. The guiding principle is 'public money for public goods', suggesting that there will be no subsidies for agricultural production or land itself but only for the public goods provided by farmland management. The ELM scheme consists of three tiers: Sustainable Farming Initiative (includes organic farming support); Countryside Stewardship (to support the Nature Recovery Network and payments for targeted action relating to features and habitats); and Landscape Recovery (bespoke, longer-term, larger scale project to enhance the natural environment). The scheme is being developed and rolled out in phases, to be fully operational in 2024. There has been a shift in some parts towards offering multiple levels of payment linked to increased environmental ambition. ELMS also places more emphasis on outcomes than previous schemes and is less prescriptive and more flexible

- National Food Strategy – independent review completed for the UK Government by Dimbleby and others in July 2021[21]. This was followed by the publication of the **UK Government's Food Strategy** in June 2022, which adopted some recommendations of the review. A year later, promises to transform the national food system were abandoned, thus making the achievement of targets for a resilient, healthier, more affordable and sustainable food supply unrealistic.

- Scotland
  - A new **Agriculture and Rural Development Bill** is currently being discussed. If the Bill is passed as introduced, Scottish Ministers will be required to prepare a five-year Rural Support Plan. This plan will include details of farming, forestry, and rural development support. Currently, four tiers of agricultural support are proposed which would allow the Scottish Government to deliver its Vision for Agriculture. The Vision aims for Scotland to become a global leader in sustainable and regenerative agriculture. Following a test programme (2022-2025), a replacement framework and legislation is to be developed to be in place for implementation from 2026.
  - The **Good Food Nation (Scotland) Act** 2022, in combination with the Good Food Nation Plan is the tool for Scottish Government to achieve its vision that by 2025 Scotland will be "a Good Food Nation, where people from every walk of life take pride and pleasure in, and benefit from, the food they produce, buy, cook, serve, and eat each day". A key outcome is related to Scotland's food system being sustainable, contributing to the natural environment, regenerating biodiversity and supporting net zero ambitions.
  - The **Scottish Biodiversity Strategy 2022-2045** (latest draft published in Sep 2023) aims to restore and regenerate biodiversity across land, freshwater and seas. One of its objectives is to embed nature-positive farming, fishing and forestry, and change farming practices so that they result in biodiversity regeneration and reduced carbon emissions while sustaining high quality food production. The Natural Environment Bill is the associated tool to put in place statutory targets.

[21] https://www.nationalfoodstrategy.org/the-report/

Section 4 - Observations from our SPI dialogue and assessment of the policy and regulatory context

There is still a very long way to go before the VISIONARY project is in a position to be able to make detailed recommendations regarding an enabling policy framework to facilitate the transition to a more sustainable food system. We can, however, synthesise some core observations based on the content within the three sections outlined in this report that attempt to provide a view on how well current and planned policies are facilitating a pathway for change. Our discussions with SPI participants have elicited what interventions they feel are necessary. We outline here a view on whether the policy framework is fit for purpose and heading in the right direction.

As outlined in Section 1 (SPI analysis) there are a myriad of interventions that are required within the food system. If one takes a big picture message from across the suite of SPI and case study topics being investigated, it is possible to identify the following core issues emerging:

(1) there is a need to build multi-stakeholder buy-in to the problems and solutions through trusted evidence based facilitation

(2) farmers require new skills (human capital) and capacity (physical capital) which in many cases will require producer collaboration (social capital)

(3) there is a need for consumer education and avoidance of confusion regarding product authenticity and sustainability delivery criteria

(4) mechanisms and infrastructures are needed for enabling consumers to purchase food direct from the producer (e.g. food hubs)

(5) there is a need for vertical and horizontal integration between sector specific governmental administrations at national, regional and local level

Taking this list as a starting point for a programme of change, it is possible to identify a number of gaps in current policy provision, based on the policy mapping exercise reported in Section 2. Firstly, it is evident from the mapping that the vast majority of policy tools are targeted at the farming community only and are focussed on specific on-farm environmental objectives with a focus on habitat creation. Whilst such objectives have merit in their own right, they do not address the need to engage other members of the food supply chain and they do not specifically help farmers with skills and capacity development. The analysis within Section 2 shows producer skills and capacity building tools do exists within the policy matrix; but they are few in comparison. The same is true for policy measures aimed at other (non-farmer) members of the value chain including the consumer.

Secondly, as can be seen above, SPI participants are calling for a need for societal buy-in to the change agenda. This goes beyond developing simple transactional relationships and requires complex discussions involving values and beliefs which in turn requires effective moral suasion policy formation. Yet what we see at the moment is the overwhelming use of economic incentives and disincentives. These are relatively easy to administer but are not capable of initiating and maintaining the 'societal discussion' our SPI dialogue strongly suggests is needed. Moral suasion policy development does appear to be on the agenda in some contexts – for example within the Scottish Biodiversity Strategy to 2045 – but the details currently lacking. Extensive facilitation is also required to enable multi-stakeholder discussion. For example, our SPIs focussing on sustainable dairy production demonstrate there is a lack of consensus around the scale of the impact and there is a lack of cooperation amongst

the actors within the dairy supply chain regarding taking action, compounded by a lack of trust in the science. Resources currently appear very limited to broker this discussion. In Hungary, we have encountered successful examples of existing irrigation communities brought together to manage water resources collectively. However, the funding to run these entities is no longer available within the CAP Strategic Plan.

Thirdly, an overarching observation worthy of note is the current lack of integration in food policy formulation and delivery at the national level. For example our SPI participants focussed on promotion of the organic sector call for multiple government departments – e.g. Agriculture, Environment, Health, Education, Business Development – to develop consistent communications and messaging in support of organic farming. Our SPI looking at short supply chains have identified public procurement as a key issue necessitating agreed action across multiple public sector departments. SPI participants in Hungary have identified a lack of cohesion and connection of responsibilities within government concerning the management of water resources. They argue for the creation of a new 'Ministry of Water Resources' to enable integration of water management to happen and the creation of a comprehensive water management strategy (to define goals and priorities) involving multiple government departments including the Ministry of Agriculture, Ministry of Interior, Ministry of Finance, Ministry of Energy & NAK (The Hungarian Chamber of Agriculture).

Our research thus far has therefore identified several weaknesses in the current policy and regulatory framework relevant to food system transition: too focussed on primary production; too focussed on simplistic economic incentive/disincentive instruments; lack of integration across public sector administrations. However, as outlined in Section 3, there are a number of EU policy mechanisms currently in development that seek to address these shortfalls. The Green Deal is taking a systems based approach, advocating sectoral linkage to integrate the administration of the environment, energy, transport, industry, agriculture, and sustainable finance. Within this policy, the Sustainable Food Systems Framework (SFSF) aims to accelerate and facilitate the transition that includes *all* actors in the value chain. Importantly, the SFSF is stressing the need for a food systems discussion and societal response to the challenge with multiple objectives include raising awareness about the importance of food systems sustainability across the public and private sector space. Of note, the EU the Food2030 platform is championing a large number of research projects with a food systems perspective.

The VISONARY project is an example of a research group working on identifying key touch points within the food system that have the potential to enable a sustainable food transition. Taking note of the findings outlined in this report, the VISIONARY team is shaping experimental research to explore the following issues:

1. How to change famers (and other actors of the food chain) understanding of the options available, boost/educational. More pedagogy is needed, but for this to be done, we need to better understand the best way to reach farmers. VISIONARY experiments pay attention to this kind of behavioural interventions. The way policy measures are perceived, their legitimacy under the eyes of actors, the capacity of well-designed information (boosts) to change choices and behaviours are all issues that will be explored as part of VISIONARY expected outcomes.

2. One of the main factors identified is the way farmer and food actor choices are conditioned by a gradient of policy interventions that go from obligatory regulations and standards to voluntary compensated commitments, including hybrid tools in between. This gradient is dynamic, since concrete practices move along that gradient over time (e.g. voluntary practices become, along successive reforms, almost obligatory actions or constraints; this is evident in the CAP evolution

and in England's ELM). VISIONARY deepens into that gradient, shading light to how actors perceive that combination of interventions and how to design a better-informed policy mix.

3. A paramount problem is the growing gap between (a part of) the farming community and EU policies approaches, which is giving rise to political tensions (there are some initiatives to try to bridge the gap). By adopting a real (and from the very beginning) transdisciplinary approach, that aims to unite farmers, environmentalists, food companies and policy makers in a set of interactions arenas (our SPI) operating at different scales (local-regional-national), and by adopting a systemic approach, VISIONARY will contribute to better understand the interactions between these actors, and facilitate much needed mutual understanding.

Appendix 1. Guidance provided to the VISIONARY team to select and describe policy tools

The guidance and matrix outlined below was used by relevant VISIONARY team members to undertake the mapping exercise.

Background

The aim of this task is to identify and characterise the main policy and regulatory tools conditioning actors' decision-making in relation to the adoption/maintenance/abandonment of sustainable production or consumption practices. This will allow us to understand the existing map of incentives, lock-ins and levers stemming from the policy and regulatory frameworks encountered. For this to be done, we ask all partners to fill in the proforma tables provided . There are two tables per identified tool, the first includes a more qualitative description of the tool and the second tackles more concrete characteristics. You will find below a first example we have elaborated.

In the process of identifying the relevant tools, please pay attention to the following guidelines/recommendations:

- The tools are directly related to the case studies. That is, we expect to identify the relevant policy and regulatory tools relating to the specific practice/intervention/decision tackled in each case study (e.g. pro-biodiversity farming practices, collective water management, climate-neutral farming, etc.). That means that each partner is expected to elaborate a document like this one for each case study it is engaged in (e.g. UPV will elaborate a document for biodiversity intervention, another for collective water management, another for plant-based transition, etc.). Please, remember that we are not looking for every tool that could influence actors' decisions on sustainable practices, only those directly related to the topic the case study is about
- The identification and characterization of the tools will be based on a combination of documentary review, previous researchers' knowledge and in-depth interviews with key informants. What we suggest is to make an initial review of existing relevant policy frameworks (e.g. Rural Development Plans, Common Agricultural Policy national/regional regulations). Based on this preliminary knowledge, researchers could conduct around two interviews with key informants (administration officers, representatives/staff of farmers unions or other associations) to confirm/identify the relevant tools. The information provided by the informants, together with the review of policy/legal documents should be sufficient to fill in the tables below
- Most of the tools conditioning actors' behaviour will be related to public policies and legal frameworks. However, the template can also include private regulatory frameworks or incentives e.g. voluntary carbon offsetting markets, private standards or labelling, private sector entities' procurement policies, etc.
- How many tools should be identified? Obviously, this depends on each case. We are aware that there are many tools that somehow condition actors' decision-making. We aim to capture the 3-4 most relevant (as a reference figure). For this prioritization, consultation with experts (see point two) is key

Tool 1

Country:		**Thematic cluster:**
Description Please provide a qualitative description of the policy tool presented. Here you can add any specific aspect or feature of the tool that is not included in the fiche and can be helpful for its better understanding. As an indication, you can add, among other: 1. A brief description of the tool, including its objectives, rationale and way of implementation. 2. How it conditions actors' decision-making in relation to the environmental issue under analysis. 3. If there is some relationship with other tools, so that one reinforces or even contradicts the other, please indicate it. 4. Besides, if the tool has been already implemented, a preliminary assessment/evaluation of its results. 5. The public/private nature of the tool has to be clarified in this description. If private, please indicate the entity responsible for its design, monitoring or enforcement, as well as the actors engaged in the implementation and the relations among them.		
Policy frame is about the policy/legal frame where the tool is included (e.g. Rural Development Program, Law, Natura 2000/Protected site Plan…)		
Type of policy frame	The kind of frame where the tool is included (e.g. Rural Development Program, Law, Natura 2000/Protected site Plan…).	
Formal title and date of implementation	Include implementation date if appropriate	
Policy level (design)	At what level (International, national, regional, local…) operates the responsible of policy design.	
Policy level (implementation)	At what level (International, national, regional, local…) operates the responsible of policy implementation.	
Detail on Tool: focuses on the specific tool/measure/intervention that is conditioning target actors' behaviour		
Formal name of the tool		
Tool classification	See Initial Conceptual Framework	
Funding	If applicable, who provides the funding, magnitude of budget, any relevant restrictions on eligibility	
Geographical coverage	Of the specific tool (International, national, regional, local…)	
Domain of application	It refers to the boundaries of the domain for which this policy frame is designed (farming system, value chain, food product…)	
Target group	Who are those directly targeted (farmers, processors, manufacturers, retailers, consumers), including additional information (specific types of addressees)	
Individual/Collective	Actors are targeted individually or as members of a collective actor	

Appendix 2. Sources for Section 3

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