ORGANIC TARGETS 4EU

Transformation scenarios for boosting organic farming and organic aquaculture towards the Farm-to-Fork targets

Report | Public

Deliverable 1.3
Synthesis of key drivers and lock-ins for organic sector development

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Table of Contents

Table of Contents 2
Abbreviations 4
Summary 7
History of changes 8
Executive Summary 9
1. Introduction 13
2. WP1 analytical approach 18
2.1. Key concepts and frameworks 18
2.1.1. Institutional approach to organic sector development 18
2.1.2. Agricultural Knowledge and Innovation System (AKIS) 19
2.1.3. Lock-in and trigger events 19
2.2. Research design and methods 20
3. Part I: Organic Agriculture 23
3.1. Recent trends and developments in the EU organic sector 23
3.1.1. EU trends in organic farming and production: a slow, but steady rise 23
3.1.2. EU trends in organic retail sales: a market of opportunities 24
3.2. Recent trends in EU agricultural support policies 26
3.2.1. Common Agricultural Policy (CAP) support 26
3.2.2. Organic Action Plans in the EU and Member States 30
3.3. Supporting and hindering factors of organic sector development 33
3.3.1. Farmers: individual to systemic drivers 33
3.3.2. Farming community 36
3.3.3. Food market 38
3.3.4. Agricultural Policy 40
3.3.5. Cooperation and coordination between actors 42
3.3.6. Factors surrounding organic farming 43
3.3.7. Additional factors 43
3.4. Organic agriculture in context: Focus country findings 44
3.4.1. Above Average: Austria and Denmark 45
3.4.2. The Average: France, Germany, Italy 58
3.4.3. Below average: Hungary and Romania 77
3.4.4. Combining key driving factors for different country groups 89
4. Part II: Organic aquaculture 93

4.1. EU trends in organic aquaculture 93
4.2. Key provisions and support for aquaculture in the EU 94
4.2.1. EU Strategic Guidelines for sustainable development of EU aquaculture (2021-2030) 95
4.2.2. Multi-annual National Aquaculture Plans 95
4.2.3. Common Fisheries Policy (CFP) 96
4.2.4. European Maritime, and Fisheries Fund (EMFF) 97
4.2.5. European Maritime, Fisheries and Aquaculture Fund (EMFAF 2021-2027) 98
4.3. Supporting and hindering factors of organic aquaculture development 99
4.3.1. Farmers 100
4.3.2. Farming community 101
4.3.3. Food market 101
4.3.4. Agricultural Policy 102
4.4. Putting dynamics and factors in context 102
4.4.1. Species differences 103
4.4.2. Focus country findings 105
4.5. The way ahead: learning from the energy transition 118
4.5.1. Macroeconomics & Policy 118
4.5.2. Networking & Innovation System 119
5. Synthesis of key findings and discussion 121
5.1. Scaling organic agriculture in the EU 121
5.2. Scaling organic aquaculture in the EU 124
6. Conclusions 127
7. References 132
8. Annexes 142

Abbreviations

AB - French organic logo

AECM - Agri-environment-climate Measures

AKIS - Agricultural Knowledge and Innovation System

ARGE - short for German “Arbeitsgemeinschaft”, Working group

ASC - Aquaculture Stewardship Council

B2B - Business to business

Biokultúra - Hungarian Association of Organic Farmers

BÖL(N) - Federal Programme for organic farming in Germany

CAGR - Compound Annual Growth Rate (CAGR

CAP - Common Agricultural Policy

CAP SP - Common Agricultural Policy Strategic Plan

CASDAR - Public fund by the Ministry of Agriculture in France

CFP - Common Fishery Policy

CLLD - Community-Led Local Development

CSAB - Organic Agriculture Scientific National Committee

ECU - European Currency Unit

EEC - European Economic Community

EGAlim – Agriculture and Food Law issued by the «Etats Généraux de l'Alimentation» (French National Food conference)

EIP-AGRI - European Innovation Partnership for Agricultural Productivity and Sustainability

EIP-AGRI OGs - Operational Groups of the European Innovation Partnership for Agricultural Productivity and Sustainability

EMFAF - European Maritime, Fisheries and Aquaculture Fund

EMFF - European Maritime, Fisheries Fund

F2F - Farm to Fork Strategy

Federbio - Federazione Italiana Agricoltura Biologica e Biodinamica (Italian Federation for Organic and Bio-dynamic Agriculture

FIBL - Research Institute of Organic Agriculture

GDP - Gross Domestic Product

GIS - Groupement d’Intérêt Scientifique

GMO - genetically modified organism

ICOEL - Danish Innovation Centre for Organic Farming

ICROFS - Danish Coordinating Body of the National Research Programmes concerning organic farming and food systems

IFOAM - International federation of Organic Agriculture

IMTA - integrated multi-trophic systems in Greece

INRAE - National French Research Institute for Agriculture, Food, and Environment

ITAB - French Organic Food and Farming Institute

KIS - Knowledge and Innovation System

LEADER - Liaison Entre Actions de Développement de l'Économie Rurale (Links between activities for the development of rural economy, now known as: CLLD)

LF - Danish Agriculture and Food Council (LF).

LFI - Austrian Rural Institute for Further TrainingLOHAS – Lifestyle of Health and Sustainability (group)

LKNÖ - Chamber of Agriculture in Lower Austria

MDKK - Million Danish crowns (currency)

METABIO - INRAE established organic metaprogramme

Mha - million hectares

MIPAAF - Ministry of Agriculture and Forest Policies, Italy

MS - Member States (of the EU)

MSC - Marine Stewardship Council

MNAP - Multiannual National Action Plans

N - Nitrogen

NGO - Non-governmental Organisation

NSPA - (Italian) National Strategic Plan for Aquaculture

(N)OAP - (National) Organic Action Plan

ÖMKI - Ökológiai Mezőgazdasági Kutató Intézet (Research Institute for Organic Agriculture)

ÖPUL - Austrian Rural Development Programme

PIF - Integrated Supply Chain Projects in Italy

PPDAB - Plan Pluriannuel de Développement de l'Agriculture Biologique

PSG - Participatory Guarantee Systems

R&D - Research and Development

R&I - Research and Innovation

RAS - recirculating aquaculture systems

RDP - Rural Development Programme

RMT - Réseau Mixte Technologique, Mixed Technology Network

SAIO - statistics on agricultural inputs and outputs (EU SAIO Regulation)

SCAR/EU SCAR - Standing Committee on Agricultural Research

SDG - Sustainable Development Goal

SEGES - Danish National Knowledge Centre for Agriculture

SINAB - National Information System on Organic Agriculture, Italy

SME - small and medium-sized enterprises

UAA - Utilised agricultural area

UMT - Unité Mixte Technologique

WOS - World of Science

WP - Work package

ZÖL - The Future Strategy for Organic Agriculture in Germany

Summary

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Executive Summary

Although the EU is currently the second-largest single market for organic products in the world, its target to have at least 25% of the agricultural land under organic farming by 2030 means that the production area would have to grow by a factor of 2.5 compared to the 2021 level. Also, the organic aquaculture sector marks hardly more than a niche market. This report endeavours to provide a thorough understanding of the diverse factors that drive or hinder development of the organic sector in the EU countries. An institutional and multi-level approach is applied to the three relevant domains – farming community, agricultural policy, and food market – in the analysis of key lessons gained from literature and practical experience in the Member States.

In principle and with the Farm-2-Fork (F2F) and Biodiversity Strategies as well as under the Common Agricultural Policy/Strategic Plans, the EU offers a common legal framework and policy support for the development of the organic sector in all Member States. However, the level of ambition, precision and (financial) support within Member States varies. On the one hand there are early adopters of national organic action plans with clear sector targets, on the other hand we also have countries, that have action plans in place only since 2023. Most national organic action plans do not give much focus on organic aquaculture.

Building on a literature review, this report provides an overview of key drivers of and lock-ins in the development of the organic sector in the EU Member States. Approaching organic farming and aquaculture as organised around key institutional domains (farming community, policy, market) the following key factors appear to be relevant:

- **Individual farmers**: *i) organic farmers' characteristics* (age, education etc.), *ii) farmers' individual drivers* (motivation, values, identity or risk perception and peer pressure) *iii) farmers' systemic drivers* (e.g. regional effects, peer-networks, access to support, education, markets, inputs, regulatory constraints or policy reliability).
- **Farming community:** *i) role of organic farming associations and certification* and possible alternatives; *ii) Agricultural Knowledge and Innovation* (AKIS): availability of extension services, education as well as research and development; *iii) prevailing farming discourses.*
- **Agricultural Policy:** *i) organic policy identity* (e.g. policy framework & commitment to organic), *ii) policy action and support* (e.g. for supply and demand, regulations / standards, action plans / national strategies, accessibility EU funding, availability/level of support payments for farms and farming community, policy support across regions, attractiveness of alternative agri-environmental programmes).
- **Food market:** *i) development of organic food market* (e.g. of supply chains, involvement of retailers, international trade); *ii) consumers personal and systemic drivers* (e.g. socio-demographic characteristics, attitudes & believes, willingness to buy, availability and price of organic and alternative products, consumer awareness and information, including on labels and their trustworthiness, peer pressures/social norms).
- **Cooperation and coordination** between actors: *i) in supply chains, ii) in policy, iii) power relations.*

- **Surrounding factors**: *i) state* (public procurement, campaigns), *ii) market* (esp. conventional); *iii) society at large* (GDP, Population /urbanisation, advocacy groups outside organic, public discourse/mass media attention).

The factors were empirically enriched by elaborating on country profiles of seven focus countries from the EU (Austria, Denmark, France, Germany, Italy, Hungary, Romania). The country profiles are based on figures and data about: i) sector development trends since 1985 (production) or 2002 (sales) based on time series; ii) agricultural production structure and market dynamics; iii) key events in policy, market and farming community specific to the country iv) agricultural policy and support (policy schemes and national action plans); v) structure, opportunities for and limitations to the national Agriculture Knowledge and Innovation System (AKIS) for organic agriculture (R&I, education, extension), vi) a summary of key drivers, lock-ins and barriers at country level.

Considering the data and literature gaps, a complementary, but 'lighter' approach for both literature review and country profiles was applied to aquaculture analysing three focus countries (Germany, Greece, Italy).

The results suggest that for the further development of the organic sector, appropriate institutions and cooperation need to be established in the farming community, the agricultural policy as well as the food market. A well-established supporting system across all domains (e.g. policy support, extension services, market access) paired with reliability, legitimacy and a perceived reduction of risk is discussed.

In light of review results and past experience key lessons are:

- **Context matters:** numerous factors are highly context-dependent and hard to generalise.
- **Supporting systems in farming community, policy, markets are interconnected:** they need to be equally developed and solid interrelations established.
- **Support payments are overestimated as triggers:** many other factors are relevant too, including perceived peer pressure, perceived risks, perceived feasibility to convert as well as private factors for re-conversion or drop out.
- **Values and identity shape organic sector development:** e.g. images of 'good' farming or products valued by consumers.
- **Conventional farming offers opportunities:** e.g. addressing problems of conventional agri-food farming at system and individual farm level.
- **Knowledge and capacity building are key**: from formal advisory and training systems and organic farming institutions, to informal networks and peer groups.

Key levers based on the country experience are:

- **Commitment** by political and market actors is key. e.g. continuity, commitment and clarity in policy measures and support.
- Combining a **supply-push** with a **demand-pull** model at different levels and along the whole value chain.

- Well-functioning **Knowledge and Innovation Systems (AKIS)** that fully integrate organic farming into agricultural extension and advisory services, e.g. regular and substantive research and development funds and private actor engagement.

For **aquaculture**, a sector that is still in its infancy but with impressive recent growth, the development of the sector also requires working on both the demand and supply side, and beyond an incentives-based approach. There are key **specificities** of the sector that need to be considered: e.g. that organic fish products do not attract consumption in ways known for vegetable or meat and that aquaculture sector is very heterogenous, certain enabling and limiting factors may only concern specific species', ecological regions or the specific phase of development where the country is. A lack of availability of organic fish feed adequately designed for the nutritional needs of different species as well as a lack of availability of organic certified juveniles, for instance, hinder the development of the organic aquaculture in a way not seen in agriculture. Organic aquaculture has a generally lower 'standing' in the organic movement and experiences high pressure from conventional producers. Significant gaps persist in terms of broad policy commitment and support at both the EU and Member States levels, including providing monetary incentives (e.g. eco-premiums for farmers and subsidised prices for consumers), regulatory simplifications, targeted marketing strategies, and well-equipped research funds to support technical solutions and better data sources as to address the pertaining data gaps and inconsistencies.

For reaching the F2F goals, many more actors need to enter organic farming, i.e. farmers, advisors, trainers, inspectors or market actors and consumers. Drawing on the key lessons learnt in this synthesis, a set of broader strategies and recommendations are provided.

Key recommendations for organic sector development

- **Programmatic approach to organic:** considering **multiple factors** from a system perspective, an active market-development policy strategy is suggested in which a **policy mix of instruments** is applied to increase both the supply of and demand for organic food products, explicitly also beyond monetary incentives (e.g. regulatory simplifications, targeted marketing strategies, including through public procurement, innovative and effective media campaigns, and well-equipped funds for research).
- **Context specific approach**: against the EU-wide target of achieving 25% of agricultural land under organic by 2030, country targets need to reflect the **different points of departure**, relevance and capabilities. Critical for reaching the EU target are the developments in the **six large agricultural countries**: Spain, Italy, Germany, France, Poland and Romania, which account for two thirds of the EU agricultural area and more than 50% of the organic area.
- **Priority on AKIS**: considering the high number of farmers needed to convert, capacity building and development needs to accelerate considerably. A better functioning AKIS and more resources for it are required, specifically for the extra efforts, including on digitalisation, **capacity building 'at scale'** as for filling persistent knowledge and data gaps, for instance, in organic aquaculture.
- **Future-proof approaches:** in light of the system-wide challenges and uncertainties of the future, new **approaches to reducing risk perception** or increasing economic **feasibility** need to be developed and **tested**.

- **Collaborative communication approach:** Considering the role of trust-building and **alliances with non-agricultural** civil society or public **actors** for strengthening the unique selling point of organic, a **more effective communication strategy** has to be adapted that highlights the societal and environmental benefits that organic brings. Overall, communication should point to the well consolidated evidence that organic is not only more environmentally friendly than conventional but can also be more profitable, while delivering food of equal or higher nutritious value with less (or no) pesticide residues.
- **Strengthening policy commitment to the organic idea:** no systemic transformation is possible without political will. In light of the limitations of markets to reflect the full 'value' of organic production, the state may take a more active role in supporting the provision of public goods through organic. The F2F targets require immediate **reforms and political action** targeted especially at AKIS, public procurement, marketing and awareness raising, and innovative campaign that foster demand.

1. Introduction

With the European Green Deal, the Farm-to-Fork (F2F) Strategy and the Biodiversity Strategy, the EU has set a series of targets to enhance the sustainability of food production in the EU. Among other things, the F2F targets (EC, 2020b) include a 50% reduction in pesticide use, a 20% reduction in fertilizer use, and the target of reaching at least 25% of the EU's agricultural land under organic farming by 2030 and of significantly increasing organic aquaculture. The organic target was also included in the Biodiversity Strategy (EC, 2020a) as was a target of 10% of farmland to be managed primarily for nature rather than food production. In 2019, the share of organic farmland was 8.5% in the EU-27. It increased to 9.9% by 2021 with an annual growth rate of only about 7.9% between 2020 and 2021, a rate too low to meet the EU target of 25% organic area by 2030. In comparison to 2021, the organic area needs to grow in size by a factor of 2.5. In 2019, organic aquaculture represented 2% of total aquaculture production (based on metric tons live weight) (EUROSTAT, 2023a). While there is no concrete F2F target for organic aquaculture, a growth to just a share of 5 % would require additional efforts for some countries.

Achieving these ambitious goals requires a balanced upscaling of both production and consumption. This implies a considerable transformation of agricultural structures and value chains well supported by a sound and easily accessible organic knowledge system. Such a transformation needs to be supported by ambitious research and innovation, strong advisory services, supportive processors and retailers, knowledge exchange and training opportunities for all organic operators and related professionals.

Against this background, the EU Project "OrganicTargets4EU" aims at supporting this transformation to reach the organic F2F targets. The project provides key evidence on the potential and underlying mechanisms of increasing organic farmland and the (socio-economic) impacts of this increase at the level of primary production, value chains and markets. Working towards an innovation ecosystem fit for achieving the organic F2F targets, OrganicTargets4EU seeks to identify key knowledge gaps and opportunities to strengthen advisory services, and capacity-building and science-practice knowledge exchange.

Such ambitious project goals need to be built on a comprehensive knowledge base of the factors relevant to organic sector development. This report provides such a foundation by presenting an assessment of the key drivers of change and lock-ins shaping organic sector development. Based on this assessment, the project will establish a multi-stakeholder process to generate a set of possible scenarios to help develop appropriate and effective policy and business strategies to achieve the organic F2F targets.

Synthesis of key drivers and lock-ins for organic sector development

The assessment of key drivers and lock-ins is based on results elaborated in the first work package (WP1) of OrganicTargets4EU consisting of five tasks (Figure 1). The overall idea of this work package was that learning from past experience, on the one hand side, and understanding current trends in the sector, on the other, is key for designing appropriate and effective policy and business strategies for the future. In line with this thinking, WP1 reflects not only on past experience and developments until today (Task 1.1 and 1.4), but also assesses more recent (and future) dynamics deriving from current political decisions or trends in knowledge and information systems (Task 1.2 and Task 1.3). This synthesis report offers a structured inventory and synthesis

of key lessons learnt (Task 1.5). The key insights build on a thorough analysis of focus country experiences, which were selected to cover geographical contexts (North-West, Central-East and South) and different stages of organic sector development ('above', 'below' or 'just EU average', see Research design and methods, 2.2). In the project, seven focus countries for agriculture (Austria, Denmark, France, Germany, Hungary, Italy and Romania) and three for aquaculture (Germany, Greece and Italy) were analysed. Additionally, drawing on insights from all EU-27 Member States, plus Switzerland and Norway, this synthesis provides a basis for the foresights and scenario analysis planned in work package 2.

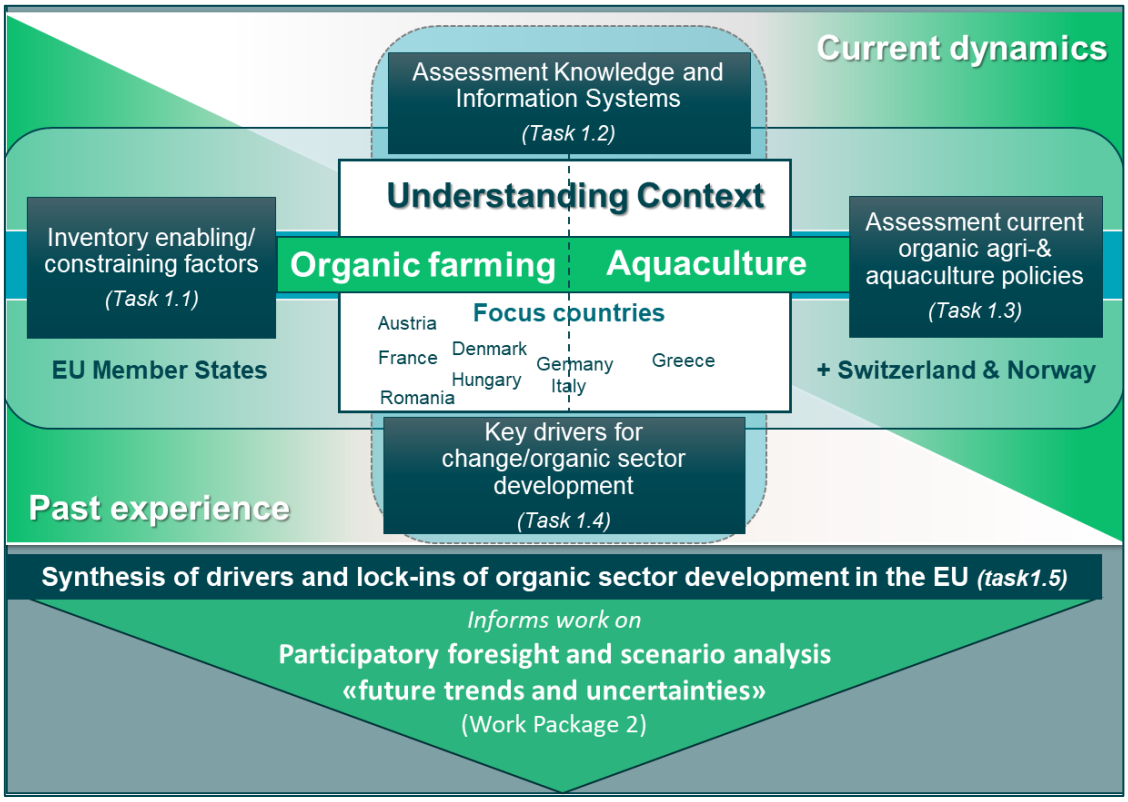


Figure 1 Structure and organization of tasks in Work Package 1

Table 1 presents the key components of each task and how these feed into this synthesis report.

Table 1. Specification of tasks in WP1 of OrganicTarget4EU as component of this synthesis report

Objectives, content, methods & results of WP1 tasks	Feeding this report as
Task 1.1 "Inventory of enabling and constraining factors on the development of organic farming, aquaculture, the organic market and food system" (Jahrl et al., 2023) • **Objective**: Lessons learnt from past organic sector development; providing an overview of all relevant enabling and constraining factors for the development of the organic sector (farming, aquaculture, market, food systems) since the 1990s • **Main content**: Inventory and analysis of enabling and constraining factors at EU level and for focus countries +CH, +NO, incl. institutional environment (policy, market, advisory systems, sector organisations/ the organic community) and economic, social and technical factors at operator level • **Data basis:** Literature (scientific, grey)[1] • **Key methods**: Review, comparative content analysis • **Result:** Internal working document	• Overview of drivers for agriculture (3.3) and aquaculture (4.3) • Country specific key drivers of sector development in individual focus country profiles for agriculture (3.4) and aquaculture (4.4.2) • Synthesis of enabling and constraining factors for development of organic sector (5)
Task 1.2 "Assessment of the knowledge and innovation systems (AKIS) for organic agriculture, aquaculture and value chain actors" (Nagy et al., 2023) • **Objective:** Identify the lock-ins related to Knowledge and Innovation Systems regarding the organic sector • **Main content:** Analysis of AKIS for organic in the focus countries based on country profiles elaborating on overall organic sector development, policy background, knowledge	• AKIS structure in focus country profiles for agriculture (3.4) and aquaculture (4.4.2) • Synthesis (5) and conclusion (6) on AKIS as enabling and constraining factor for development of organic sector

[1] The literature review explores scientific and grey literature on organic farming and organic aquaculture starting from the 1990s to present considering EU member states as well as Norway, Switzerland and the UK. Specific focus was laid on the focus countries as part of OrganicTargets4EU. The review was based on the institutional framework elaborated by Michelsen (2001), which provided the basis for data collection (search string) and data analysis (coding). The literature search for farming and aquaculture have been carried out separately, but considering a coordinated strategy for search and analysis (search string, coding etc.). The basic search string was developed for a search in Web of Science and adapted to the other databases used (Scopus, Google scholar, Cordis, Orgprints). Overall, the literature analysis was based on four sources of literature: scientific databases for peer-reviewed papers, databases for grey literature, literature provided by task team members and experts, additional literature provided by practice partners of the focus countries. Overall 173 documents were analysed on organic farming and 82 documents on organic aquaculture.

Objectives, content, methods & results of WP1 tasks	Feeding this report as
creation and innovation, education and training, advice / consultancy. • **Data basis:** Expert interviews, online survey, stakeholder mapping • **Key methods:** Qualitative content analysis, statistical analysis • **Result:** Deliverable 1.1	
Task 1.3 "Assessment of current organic agricultural and aquaculture policies" (Lampkin et al., 2024) • **Objective**: Analyse the current changes in organic policies as a response to the EU organic F2F targets • **Main content:** Analysis of the CAP Strategic Plans and current national/regional Organic Action Plans for all EU MS for the period 2021 to 2027. Comparison of results with the plans of the 2014-2020 period. • **Data basis:** CAP Strategic Plans (SP) and national Organic Action Plans (NOAP) policy documents compared with Lampkin & Sanders, 2022 • **Key methods:** quantitative /qualitative content analysis • **Result:** Deliverable 1.2	• Recent agricultural policy trends (3.2) • Agricultural policy support & action plans in individual focus country profiles for agriculture (3.4) and aquaculture (4.4.2) • Synthesis (5) and conclusion (Conclusions6) on enabling/constraining factors
Task 1.4 "Influence of key drivers for change on organic sector development" (Rees et al., 2023a) • **Objective**: Analyse relationship between key drivers and organic production and market development • **Main content**: Trends and structural changes in development of organic production and market (including e.g. organic area, production, operators, retail sales and international trade) and impact of relevant policy interventions on those trends (building on Task 1.1. and 1.3). Compilation and analysis of time-series based on statistics on organic farming and aquaculture in EU Member States, Switzerland and Norway • **Data basis:** Statistics, survey • **Key methods**: Statistical analysis, content analysis • **Result:** Internal working document	• Data in introduction (1) • Data and figures on trends and developments in the organic sector (3.1) • Key events, data and figures in individual country profiles on agriculture (3.4) and aquaculture (4.4.2)
Task 1.5 Synthesis of key drivers and lock-ins for organic sector development • **Objective:** To synthesize key findings as baseline for subsequent work packages • **Main content, data basis, key methods**: based on T1.1-T1.4 • **Result**: Deliverable 1.3	• *Report itself is focus of task 1.5*

Going well beyond a summary of the five working tasks, this synthesis report recombines the key findings deriving from the individual tasks in a way that allows elaborating on distinct, but also shared, insights as well as general and country-specific patterns in a structured way. The focus country-oriented approach enables us to identify specific factors behind recent dynamics seen in some, but not in other countries of the EU. With its integrated, analytical, and empirical approach, the report transcends country-based evidence and allows for systemic understanding of the full set and combinations of forces behind organic sector development.

2. WP1 analytical approach

2.1. Key concepts and frameworks

2.1.1. Institutional approach to organic sector development

To identify the factors behind the development of the organic sector, work package 1 draws on the institutional conceptualization as suggested by Johannes Michelsen (2001a, cf. Figure 2 applied to farming), which highlights the interrelationship between the farmer and the institutional environment that farming takes place in. In this conceptualization, society is composed of three parts: the state (based on political authority), the market (based on economic competition) and civil society (based on civil solidarity within families, social groups, etc.).

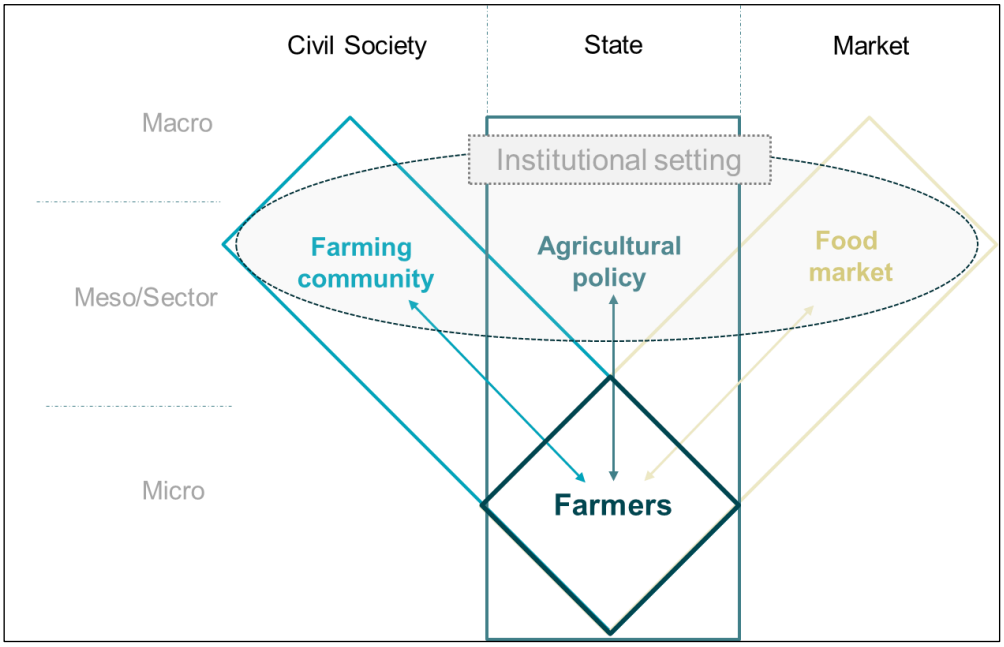


Figure 2 Cross-sectoral and multi-level interrelationship between farmers and their institutional environment

Source: Based on Michelsen (2001a).

Following the idea that society is organized across three levels, society at large forms the macro level, while individual farmers operate at the micro level. At the interface, meso- or sector-level organizations are mediating between the macro and micro levels. Applied to (organic) farming, the farming community, agriculture policy as well as the food market domain represent the three key societal domains to consider. Principles of solidarity among farmers, interest representation or knowledge exchange characterize the relationship within the farming community. By contrast, public agencies interact with farmers by means of regulation or support schemes in the agriculture/aquaculture policy domain. In food markets, farmers interact with businesses based on demand for agricultural produce for processing and marketing.

2.1.2. Agricultural Knowledge and Innovation System (AKIS)

The prevailing understanding of AKIS is rooted in the concept of "Agricultural Knowledge and Information Systems" developed by Nils Röling in the 1980s, which emerged from a critique of the perspective of agricultural knowledge systems as linear approaches to knowledge transfer (Röling, 1988). The initial concept of AKIS was significantly shaped by an "infrastructure perspective," which focused on organizational frameworks and entities. This perspective revolved around the idea that knowledge production and exchange in the agricultural sector is based on a wide range of sources, including research, agricultural extension, education/training and support services. Today's approach is an evolution of this original concept: it strongly emphasises "innovation"[2] and "process view", where innovation systems are seen as self-organising, growing networks of actors (Klerkx et al., 2012; Röling & Engel, 1991; Sutherland et al., 2023). In this approach, innovation linked to research is seen as a driver of economic development. Also, the novel perspective emphasises the importance of transdisciplinary knowledge and the involvement of different actors (e.g. farmers, extension services, the private sector, processors and retailers) within a "multi-actor approach" promoting research and innovation. In line with an institutional and system approach to the agricultural system (Michelsen, 2001a), innovation can be thought of as a system that is composed of institutions and actors' networks that foster, diffuse and utilize innovations (e.g. Malerba, 2002) and in which a set of "important economic, social, political, organizational, and other factors […] influence the development, diffusion, and use of innovations" (Edquist, 1997, p14).

This novel perspective on knowledge systems has been strongly influenced since the mid-2010s by the EU's SCAR-AKIS working group. This group has been crucial in setting EU-level policies aimed at promoting knowledge exchange and innovation in the agricultural sector, particularly through the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI) (Sutherland et al., 2023).

Different definitions of AKIS have emerged over time. In this study, it was important for us to use a consistent definition in our communication with practice partners and stakeholders. We have chosen the following phrase as a working definition to guide data collection and analysis: The Agricultural Knowledge and Innovation System (AKIS) can be defined as a system that links people and organisations to promote mutual learning, to generate, share and utilise agriculture-related technology, knowledge, and information within a country or a region.

2.1.3. Lock-in and trigger events

The distinctiveness of organic farming in comparison to conventional farming practices makes the concept of innovation appealing for approaching the process of conversion (Padel, 2013). When studying how and when exactly innovation takes place in socio-technical systems change

[2] "Innovation" may be defined as the first commercialization of an invention or first occurrence of an idea for a new product or process (e.g. way of farming). An innovation occurs within the market, companies or society when new routines are emerging while current habits start losing ground (Bianchi and Miller, 1996). Progress from invention (the idea) to innovation requires a combination of different types of knowledge, competences, resources and capabilities (Fagerberg, 2006).

is often conceptualized as happening incrementally. However, as some authors stress, major change may rather happen in direct response to so called 'trigger events' (Wilson, 2007). Major change in farming trajectory, or a 'transition', means that a considerable amount of farming activities or resources are re-oriented, e.g. from commercial to care farming or other diversification activities. Converting to organic farming marks such major transition because it involves the development of new markets, additional sources of information and of new production practices. Still, farmers may move incrementally into this direction even prior to the actual conversion, making the actual transition less dramatic than is the case on other farms (Sutherland, 2011).

Path dependency and lock-in of contemporary farms are seen as the key forces in play, why trigger events are required to instigate change (e.g. Tisdell, 2003; Vanloqueren and Baret, 2008). In line with the economic use of the terms 'lock-in' or 'path dependency' present circumstances are stressed as to be determined or strongly influenced by previous conditions (e.g. Arrow, 1963). A trigger event implies that relevant experiences are accumulated and lead a farm manager to recognize that major changes in farming activities need to happen. Such understanding of experiences being 'triggers' for change is in line with the understanding in Social Psychology that 'trigger events' in the course of life lead to major changes in action (e.g. De Jong and Graefe, 2008).

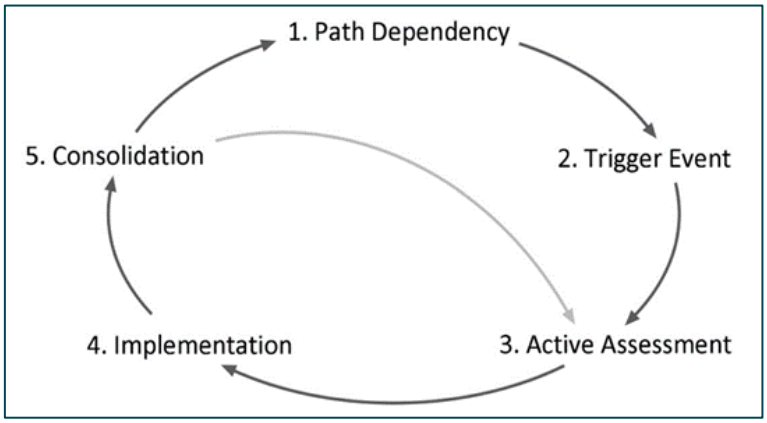


Figure 3 The "Triggering Change" cycle

Source: Sutherland et al. 2012.

Thought of as a triggering change cycle (Sutherland et al., 2012, see Figure 3 The "Triggering Change" cycle), a trigger event would then be followed by the active assessment of options (Stage 3) and implementation (Stage 4). During the consolidation phase (Stage 5), a farming system may be altered and refined based on early implementation experience into a consolidated, i.e. more or less stable (and locked-in) system.

In line with our institutional and system-based approach to agriculture and innovation, triggering events may extend well beyond individual experience and decisions. In reflection of this system thinking, we use the term 'key events' to reflect the power that relevant events in policies or markets may exert not only on individual farmers, but across whole communities and societies.

2.2. Research design and methods

In line with the idea of providing a "synthesis of drivers and lock-ins of organic sector development", this report provides a structured inventory of key lessons learnt from the work in and

across the four different tasks in WP1. The intention was to gain a thorough, yet empirically informed understanding of the relevance of different key drivers and their combinations for boosting organic farming and aquaculture across countries in the EU. To this end, this synthesis not only distils the key insights and lessons learnt from individual tasks in WP1 but combines them in a structured way applying the framework by Michelsen. Reflecting the considerable differences of organic agriculture and aquaculture, the synthesis was conducted separately for each sector.

While the report is based on the key lessons learnt and reflected in individual milestone reports and deliverables (Task 1.1 to Task 1.4), the key insights from this synthesis were discussed in depth with key informants from practice and science in an iterative process. In 2023, several workshops were conducted on i) organic agriculture and ii) organic aquaculture as to challenge the insights of this inventory of key drivers on the basis of expert opinion and practical experience from the focus countries:

- WP1 synthesis workshop on organic agriculture with OrganicTargets4EU WP leaders and other project partners within the consortium, 15 participants, 12 June 2023, online.
- WP1 synthesis workshop on organic aquaculture with organic aquaculture experts within and outside the consortium, 10 participants, 22 June 2023, online
- WP1 synthesis reflection with more than 35 project and practice partners from eight different countries at the annual consortium meeting in Lecce, 12-13 Sept. 2023, hybrid.

In addition, advanced versions of all focus country profiles on organic agriculture and aquaculture were shared with key practice partners and academic experts within the consortium to obtain feedback on the relevance and consistency of the key lessons synthesised for different countries as well as for specific groups of countries. Moreover, the key insights highlighted in this report for and across specific country groupings were discussed with the full consortium and shared with a designated multidisciplinary team representing different countries.

Grouping of countries to support analysis

Considering the high relevance of contextual dynamics for organic sector development, the focus-country approach in our study allows us to empirically substantiate the review, assessment, as well as scenario development. Specific groupings of focus countries allow us to identify and elaborate on context-specific patterns which in turn foster our understanding of how organic agriculture develops in practice based on the interplay of different relevant factors.

The groups of countries show different stages of development considering the share of organic farmland and retail sales. Austria and Denmark are "above the EU-average" in both development strands. While Germany and France have an "average" performance in both categories, Italy lands in an average range despite a high share of organic farmland, because of its relatively low development of the organic market. The organic shares in Romania are "below the average" of other focus countries. Hungary shows a low organic market development but a share of organic farmland closer to "average" than Romania.

Table 2 Focus country grouping based on shares in organic farmland and sales in 2021

Organic share of farmland %		Focus country	Focus country	Organic share in retail sales %	
Above average	26.5	Austria	Denmark	13.0	Above average
	16.7	Italy	Austria	11.6	
Average (+/- 50% EU average)	11.5	Denmark	Germany	7.0	Average (+/- 50% EU average)
	10.8	Germany	France	6.6	
	9.9	EU-27 average	EU-27 average	4.7	
	9.6	France	Italy	3.4	
	5.9	Hungary	Hungary	0.3	Below average
Below average	4.3	Romania	Romania	0.15	

Based on data from: Eurostat/ FiBL, Rees et al. 2023a[3]

Limitations of the research

The data used in the research presented in this report have some limitations. As for the statistical data, some gaps and inconsistencies between multiple data sources were found. This is especially the case for organic aquaculture and on retail markets in Romania and Hungary. Some of the indicators, while offering consistent data (where existent) across countries, may also not reflect the full development of the sector: e.g. retail sales as a proxy for market development do not include variable-weight product sales, e-commerce, direct sales or specialised shops.

The qualitative data gathered to enrich the analysis especially on AKIS and the key events for sector / market development builds on interviews and surveys with experts and relevant stakeholders in the different countries, including supply chain actors of the organic farming and aquaculture. However, because of the relatively limited number of experts and stakeholders taking part in the interviews and the survey, the overview provided does not necessarily reflect the full picture of the sector.

[3] Retail sales values for Hungary /Romania based on estimates without updates in several years. Real values may be higher.

3. Part I: Organic Agriculture

3.1. Recent trends and developments in the EU organic sector

The EU targets of having at least 25% of the EU's agricultural land under organic farming by 2030, and a significant proportion under organic aquaculture, are highly ambitious. They provoke the question how exactly these targets may be reached until the end of the decade. To that end, this chapter provides a first idea of current levels of sector development, not only for the EU but also for different EU countries, while considering how quickly (or slowly in some cases) countries have developed towards current levels. This section provides relevant data on both the extend as well as recent and past development (since the 1990s) of i) organic farming area, ii) organic sales and iii) the corresponding data for aquaculture development. The country-specific figures give a first indication not only of trends in relation to the new sector target of the EU but also how those past trends differ for different (groups of) countries, respectively.

3.1.1. EU trends in organic farming and production: a slow, but steady rise

As concerns the volume of organic land and producers the EU has experienced a steady growth between 2012–2021: In 2021, already around 16.0 million hectares (Mha) were managed organically; more than half of it in four out of the 27 EU countries: France (2.8 Mha), Spain (2.6 Mha), Italy (2.2 Mha) and Germany (1.8 Mha). Most of organic farmland (ca. 50%) was arable land, followed by permanent grassland (ca. 40%) and permanent crops (10%), with the key arable crop group being cereals (2.95 Mha) and the core permanent crop olives (0.6 Mha). The strongest growth between 2020-2021 was noted for oilseeds (+11.4%) and the highest area share (>10%) by olives and grapes.

Despite the considerable growth of organic land in the EU up to 2021 levels of 9.9% (see Figure 4), the average Compound Annual Growth Rate (CAGR)[4] of 6.7% seen EU-wide between 2021 and 2021 would be too low as to achieve the 25% target by 2030. Conscious of the different points of departure and ambition behind national sector targets, Austria (26.5%), Estonia (23%) and Sweden (20.2) ranged already near or above the 25% target in 2021, whereas several other countries were placed significantly below, e.g. Bulgaria (1.7%), Ireland (1.9%) or Poland (3.5%).

Of the little less than 380,000[5] organic producers in the EU, almost one fifth are from Italy (75,874), followed at a distance by France (58,413) and Spain (52,861). Overall, the number of organic operations both in production (+8.2%) and processing (+5.2%), but also imports (+9.2%), is on the rise.

[4] The Compound Annual Growth Rate (CAGR) is a measure to demonstrate average annual growth over a period of time. It is calculated by dividing the value at the period's end by its beginning value, raised to the exponent of 1 divided by number of years, minus 1.

[5] Commas indicate 10^3 steps in numbers and dots indicate decimals.

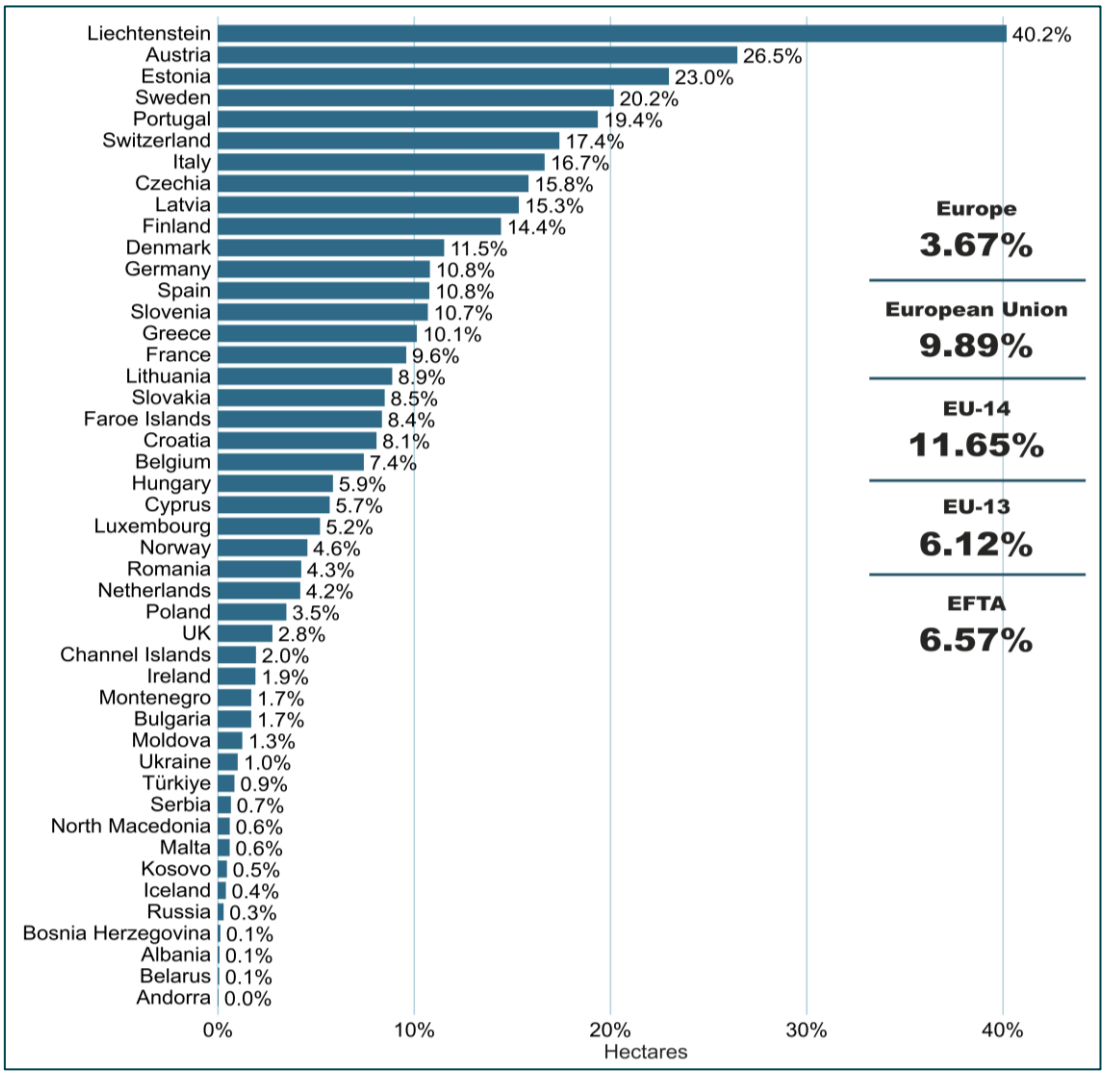


Figure 4 Organic shares in total agricultural land in Europe, 2021 organic farmland 1985-2021 and required growth by 2030

Source: FiBL-AMI survey, 2023 (Rees et al., 2023a)

In essence, organic farmland needs to grow by factor 2.5 or increase by a CAGR of 10% (2020-2030) to reach a 25% share by 2030 (> 40 million hectares), and with that at a much faster rate than in the 2001-2021 period (see Figure 4).

3.1.2. EU trends in organic retail sales: a market of opportunities

With retail sales worth 46.7 billion euros in 2021, the EU represents the second-largest single market for organic products in the world (after the USA). A third of the EU sales occurred just in Germany (15.9 billion €). Overall, the European Union's organic market value has doubled between 2012–2021. Denmark had the highest organic retail sales share globally (13.0%, see Figure 5).

Austria reached 11.6%, and Switzerland, one of the 29 countries analysed in OrganicTargets4EU, reached 10.9%.

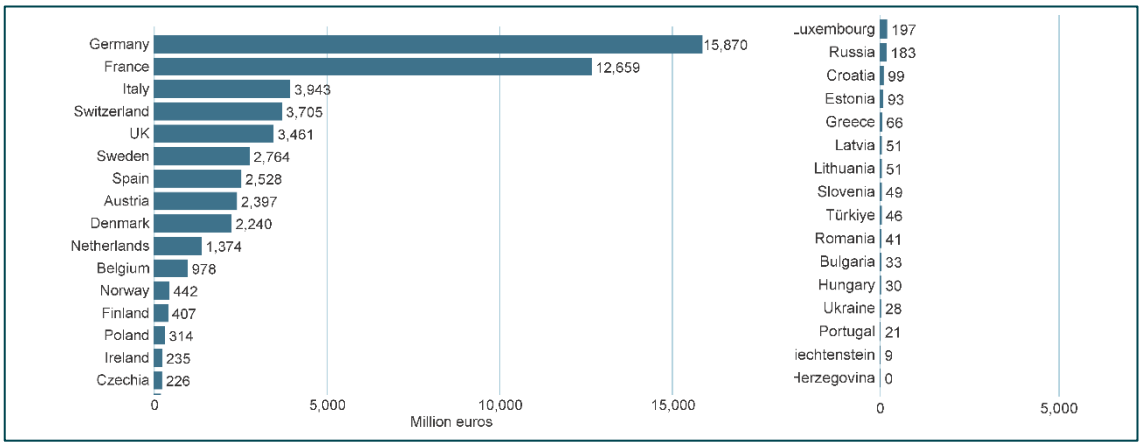


Figure 5 Organic retail sales in Europe in 2021 by country (million euros)

Source: FiBL survey, 2023 (Rees et al, 2023a)

The organic market recorded a modest growth rate of just about 4% in 2021, considerably lower than the 15% increase in 2020, the first year of the COVID-19 pandemic. However, in 2021 some markets showed double-digit growth; the highest in Estonia (+21%). From 2001–2021, the EU's organic market value increased almost sevenfold.

EU consumers spent on average 104.3 euros on organic food per person in 2021, meaning consumer spending per capita on organic food has doubled in the last decade. Swiss (425€) and Danish (384€) consumers had the highest spending on organic food.

EU organic imports show a small but steady growth trend. In 2021 2.87 million metric tons of organic products were imported. Compared to 2020 (the first year of the pandemic), this is an increase of 3%. Compared to 2018 (the first year of available data), EU organic import volumes increased by 6% and, therefore, considerably less than the organic farmland (+18%) and retail sales (+30%) in those four years.

The Netherlands, which re-exports high volumes to other European countries, was unsurprisingly the largest importer. Germany and Belgium rank second and third. The key product group in imports was tropical fruits (0.8 million metric tons), and Ecuador (0.35 million metric tons) the largest supplier, followed by Dominican Republic and India. Decreases were noted for cereals and oilseed imports.

At least over the last 10 years, there was a certain disconnect between market demand and growth in production, area and processing (see Figure 6). While markets for organic products have – in relative terms – shown a more rapid growth than production and processing, it seems that this market expansion did not directly trigger growth in domestic production and processing of equal magnitude.

Market growth alone may not suffice as explanatory, pulling factor and other factors, like political support, capacities of farmers or support services, may matter as much for speeding up organic sector development.

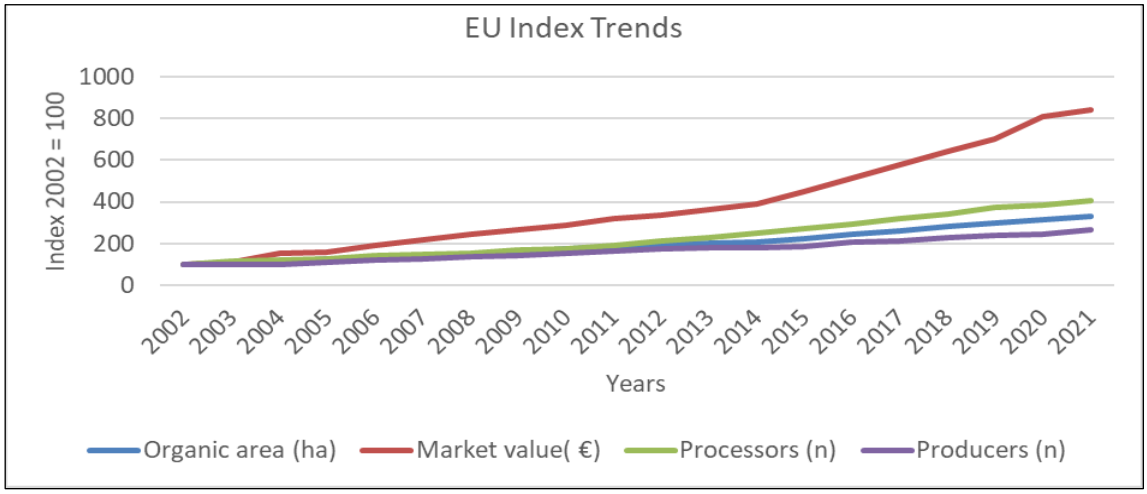


Figure 6 Development of EU organic area, market, processors and producers between 2002 and 2021

Source: Lampkin et al., 2023

3.2. Recent trends in EU agricultural support policies

This section provides a brief outline of the key EU-wide policy changes that are relevant for organic farming in all Member States. The recent support policies in view are those resulting from the new CAP for 2023-2027, the Green Deal (European Commission, 2019), the Farm to Fork (European Commission, 2020b) and Biodiversity (European Commission, 2020a) Strategies and EU 2021 Organic Action Plan (OAP) (European Commission, 2021). A brief elaboration of these measures provides an overview of the policy framework in place for reaching the 25% target at EU level. Put in country context (e.g. of focus countries), it allows reflecting on the different ways of how countries respond to and implement the EU frameworks.

3.2.1. Common Agricultural Policy (CAP) support

Organic farming has been the subject of increasing policy support at EU and also at national level since the late 1980s. A few countries introduced support for conversion to and maintenance of organic farming, in part as a response to the challenges with food surpluses. With the advent of a common EU regulation (Council of Europe (CoE), 1991) and the accompanying agri-environmental measures (Council of Europe (CoE), 1992) conversion to and maintenance of organic farming were established under the Common Agricultural Policy Pillar 2 measures. The support was later extended to cover prioritization for other Rural Development Programme (RDP) interventions, including capital investment and processing and marketing grants, training and advice. Separately from Pillar 2, also consumer promotion, public procurement and research were specified (Lampkin & Sanders, 2022). In the last CAP programming period (2014-2020, extended to 2022), organic farming was covered in an own Article under the Rural Development Regulation (EU, 2013).

Level of support

Organic area growth correlates well with the expenditure for policy support. By 2018, almost 8.8 million ha (64% of 13.8 Mha) organic land were supported at an annual cost of nearly €1.8 billion (cf.Table 3). With that, support was more than 7 times higher than in the year 1997, when 2.5 Mha

were certified (Lampkin et al., 1999b), and twice the amount available in 2007 with half the area under certification (7.5 Mha).

Table 3. Key indicators of agricultural support in 2018 in EU countries: general (total budget, area, per ha payment) vs. certified (area, share certified area/UAA, focus countries=bold)

EU support for organic agriculture in 2018							
Ordered by average support per ha				Ordered by % certified area supported			
Country	Total support (million €)	Total land area supported (kha)	Average support (€/ha)	Country	Total land area certified (kha)	Share certified area supported	Share certified utilized agr. area
Cyprus	4	5	805	Czechia	520	97%	14.8%
Greece	97	248	390	Ireland	74	97%	1.6%
Malta	0.002	0.01	374	Portugal	213	96%	5.9%
Bulgaria	24	68	354	Slovenia	48	96%	10.0%
Italy	386	1,098	352	Latvia	280	93%	14.5%
Croatia	33	94	350	Finland	297	92%	13.1%
Germany	300	1,150	261	Croatia	103	91%	6.9%
Luxembourg	1	5	258	Estonia	207	90%	21.0%
Belgium	19	80	243	Belgium	89	89%	6.6%
Austria	121	515	234	**Denmark**	257	87%	9.8%
Romania	42	183	232	Luxembourg	6	85%	4.4%
Sweden	75	355	211	Slovakia	189	84%	9.8%
Slovenia	10	46	210	**Austria**	639	81%	24.1%
Finland	56	274	205	**Germany**	1,498	77%	9.0%
Lithuania	36	184	197	Lithuania	240	77%	8.1%
Hungary	21	115	186	Cyprus	6	76%	4.5%
Denmark	41	223	184	U. Kingdom	457	74%	2.6%
France	180	1,040	173	Poland	485	71%	3.3%
Spain	159	1,045	152	Sweden	609	58%	20.3%
Poland	47	342	138	**Italy**	1,958	56%	15.2%
Portugal	25	206	124	**Romania**	326	56%	2.4%
Ireland	8	72	111	**Hungary**	209	55%	3.9%
Slovakia	17	158	108	Bulgaria	129	53%	2.6%
Latvia	28	261	107	**France**	2,035	51%	7.0%
Czechia	53	506	105	Greece	493	50%	9.3%
Estonia	18	186	99	Spain	2,246	47%	9.3%
U. Kingdom	18	338	53	Malta	50	13%	0.4%
Netherlands	0	0	0	Netherlands	64	0%	3.5%
EU28	**1,821**	**8,798,000**	**207**	**EU28**	**13,677,000**	**64%**	**7.6%**

Source: Lampkin & Sanders, 2022; Lampkin et al., 2024; Focus countries highlighted in bold; light blue shades for values in the +/- <49% range of EU average; dark blue shades for values 'above' and no shade for 'below' average.

In 2018, all Member States, except for the Netherlands, provided support for conversion and/or maintenance, but partly with intermittent engagement where resources were limiting. France stopped maintenance payments in 2018. Payment rates per hectare varied widely within and between Member States (EU average: 207 EUR/ha, UK: 53 EUR/ha, Cyprus: 805 EUR/ha, see Table 3). The variances are a reflection of diverse regional conditions, different political priorities and applicable differentiations by crop or livestock species (Lampkin & Sanders, 2022).

CAP Reform and Strategic Plans

For the CAP 2023-2027, Member States (MS) were required to produce national CAP Strategic Plans to be endorsed by the EC (EU, 2021). This was intended to simplify the CAP process, in part by reducing the number of regional rural development plans. It was also intended to pass to MS responsibility for defining measures to achieve the specific CAP objectives. The EC continues to ensure that these objectives are being met and that measures are appropriate in the context of defined national needs and priorities. Comparing the finally agreed 27 SPs and support levels with the last CAP, all MS now have support in place for organic farming conversion and maintenance, using a mix of Pillar 1 and Pillar 2 approaches (Figure 7).

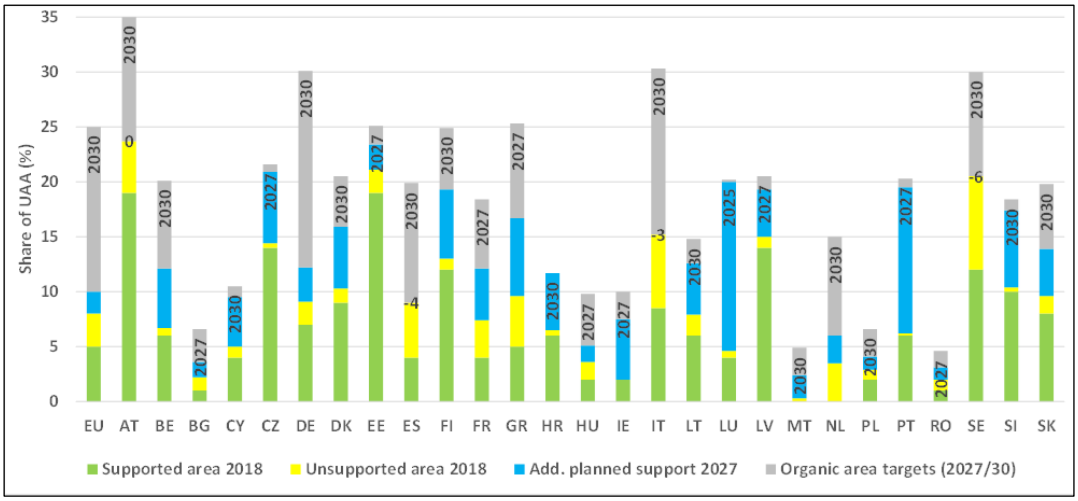


Figure 7 Share of current or planned (un)supported organic area vs. targets in Organic Action Plans of EU-27 MS

Source: Lampkin & Sanders, 2022; Lampkin et al., 2024.

While the payment rates foreseen are similar to 2015-2022, most MS plan for additional organic support. Yet, the number of countries that will actually increase per ha payment is low (Figure 7).

Table 4. Planned (2027/28) vs. formerly (2018) supported organic area and expenditure in context of area share and sector target[6]

Country	Share organic area in 2021	National sector target % of UAA by 2030 (2027)	Ratio targeted vs current % of UAA (*basis of sorting*)	Ratio supported organic area 2027 vs 2018	Ratio expenditure for organic 2027 vs. 2018	Ratio expenditure for organic per ha 2027 vs. 2018
Malta	0.60%	5%	833%	4175%	43639%	1045%
Ireland	1.90%	10% (7.5%)	526%	468%	1116%	239%
Bulgaria	1.70%	(7%)	412%	293%	416%	142%
Luxemburg	5.20%	20% (2025)	385%	494%	656%	133%
Netherlands	4.20%	15%	357%	∞**	∞**	∞**
Germany	10.80%	30%	278%	207%	184%	89%
Belgium*	7.50%	19%	253%	205%	238%	116%
Greece	10.20%	(25%)	245%	340%	267%	78%
Poland	3.50%	7%	200%	193%	530%	275%
France	9.60%	(18%)	188%	325%	335%	103%
Spain	10.80%	20%	185%	120%	106%	88%
Italy	16.70%	30%	180%	136%	77%	57%
Denmark	11.40%	20%	175%	181%	181%	100%
Cyprus	5.70%	10%	175%	250%	143%	57%
Finland	14.40%	25%	174%	212%	160%	76%
Slovakia	11.70%	20%	171%	171%	212%	124%
Hungary	5.90%	(10%)	170%	242%	294%	121%
Lithuania	8.90%	15%	169%	168%	175%	104%
Slovenia	10.80%	18%	167%	178%	228%	128%
Sweden	20.20%	30%	149%	123%	97%	79%
Croatia	8.10%	12%	148%	296%	191%	65%
Czechia	15.80%	(22%)	139%	148%	198%	134%
Latvia	14.80%	(20%)	135%	141%	117%	83%
Austria	26.50%	35% (30%)	132%	118%	127%	107%
Romania	4.30%	(5%)	116%	163%	133%	82%
Estonia	23.00%	(25%)	109%	81%	30%	38%
Portugal	19.40%	(20%)	103%	335%	338%	101%
EU27	9.90%	25%	253%	193%	185%	95%

Source: Lampkin et al., 2023, table sorted by ratio of expenditures for organic 2027/18.

[6] Colours and fonts: **Focus countries bold**; sorted by "Ratio targeted vs current % of UAA" (in 2021): Shades reflect modest (no colour, up to 150%), moderately high (light blue, 151-250%) and very high ambition (dark blue); Ratios supported organic area and expenditure for organic 2027 vs. 2018: In light of ambition levels ratio support for area or expenditure (vs. 2018 levels) is considerably (dark blue), moderately (light blue, +/-

The EU and Member States' support expenditures on organic farming as well as the area under the CAP Strategic Plans are set to almost double by 2027/8 compared to 2018; reaching 3.3 billion € and 10% of the EU UAA, with organic support accounting for 5% of total CAP expenditure in 2023-2027. Most MS have set higher national targets (grey columns in
Table 4) for certified organic and in-conversion land, either in their CAP Strategic Plans (SPs), or within NOAPs, which were partly produced after the CAP SPs had been agreed. The target year date also differs, with many focused on 2030 and looking beyond the current CAP period. These national targets are equivalent to almost 20% of EU agricultural land by 2030.

Pillar 1 and 2 payments for organic on the rise

Under the new CAP Regulation, Member States may support organic farming either as a fully EU-funded, flexible Pillar 1 Ecoscheme (Art. 31) or as a Pillar 2 RDP agri-environment measure (Art. 70), to be co-financed by Member States and based on the model of 'forgone income' or additional costs. Most Member States continue to use Pillar 2 for both conversion and maintenance payments. Denmark is the only country to draw only on Pillar 1 for both purposes. Numerous Member States, like France, Bulgaria, Latvia, or Portugal used combinations, either specifically to support conversion with longer term agreements, or to cover specific aspects of schemes, such as payments for livestock production. In fact, some countries, like Austria, and some regions in Spain and Italy, do not differentiate between conversion and maintenance payments.

The rates of payments for organic maintenance and conversion were reduced in 2023 compared to 2019 only in Austria, Belgium and Spain. They stayed more or less stable in countries like Croatia, Denmark, Italy, Latvia, Portugal, Romania and Sweden. The majority of the countries have increased their payments, France, Ireland, Malta and Netherlands even significantly (more than double). While France and the Netherlands have (re)introduced support payments, Malta intends to incentivise the organic production for horticulture at small scales. Still, some countries' decision to keep payments constant or even reduce them over a period of 13 years (2015-2022 and 2023-2027) is 'notable' in light of their ambitious sector targets and the underpinning forgone income approach (vis-à-vis considerable inflation).

3.2.2. Organic Action Plans in the EU and Member States

The setting of the 25% target for organic farming represented a major shift in the policy priority allocated to organic farming. It was reinforced by the expectation in the most recent EU Organic Farming Action Plan (European Commission, 2021) that all MS would include strategic initiatives for organic farming in their CAP Strategic Plans covering the period 2023-2027. Organic action plans have been widely used at EU, national and regional levels since the mid-1990s (Lampkin & Sanders, 2022; Meredith et al., 2018).

15% range in) or not high (white; <15% below ratio). Ratio per ha expenditures for organic are considered without ambition (white) if below EU average inflation levels (ca. 25% in 9 years), modest (light blue) if between 125% and 175% of prior funding period, and high (dark blue) if above 175%. Note: ratio-based values discriminate countries with high absolute targets or expenditures but low increment. *Value for Belgium are for the whole of the country, taking account of the different targets in the two regional action plans. **No values can be displayed for the Netherland due to a zero-starting point.

Key features of organic action plans include:

- Setting (relevant, ambitious and resourced) development targets, e.g. 25% of land area by 2030, but targets can also be market-focused or relate to knowledge or information-based activities, including research;
- Recognising the dual role of organic farming as delivering both public goods (environmental and other benefits) and market products, and integrating policies to deliver both;
- Identifying specific local needs/priorities as the basis for specific actions;
- Building and strengthening public/private partnerships;
- Integrating supply-push and demand-pull measures, in order to resolve policy conflicts and maximise synergies, and to support stronger links between producers, food businesses and consumers.

The European Commission has launched three action plans on organic food and farming (2004, 2014 and 2021). While focused mainly on the actions of the European Commission, the action points serve as a reference for Member States to provide more support for organic through their respective national CAP SPs, RDPs or NOAPs. All but two Member States (Greece and Lithuania) have national organic action plans currently being implemented or due to be launched later in 2023 or early 2024 (see Figure 8 , green bars). This is a significant change compared with the last programming period where several countries had no action plan in place or a significant time gap since the previous action plan (blue bars; cf. Lampkin & Sanders, 2022). Some countries like Denmark were early adopters (1990s) and have continued to evolve their plans, whereas others have been less consistent or rather late in the process.

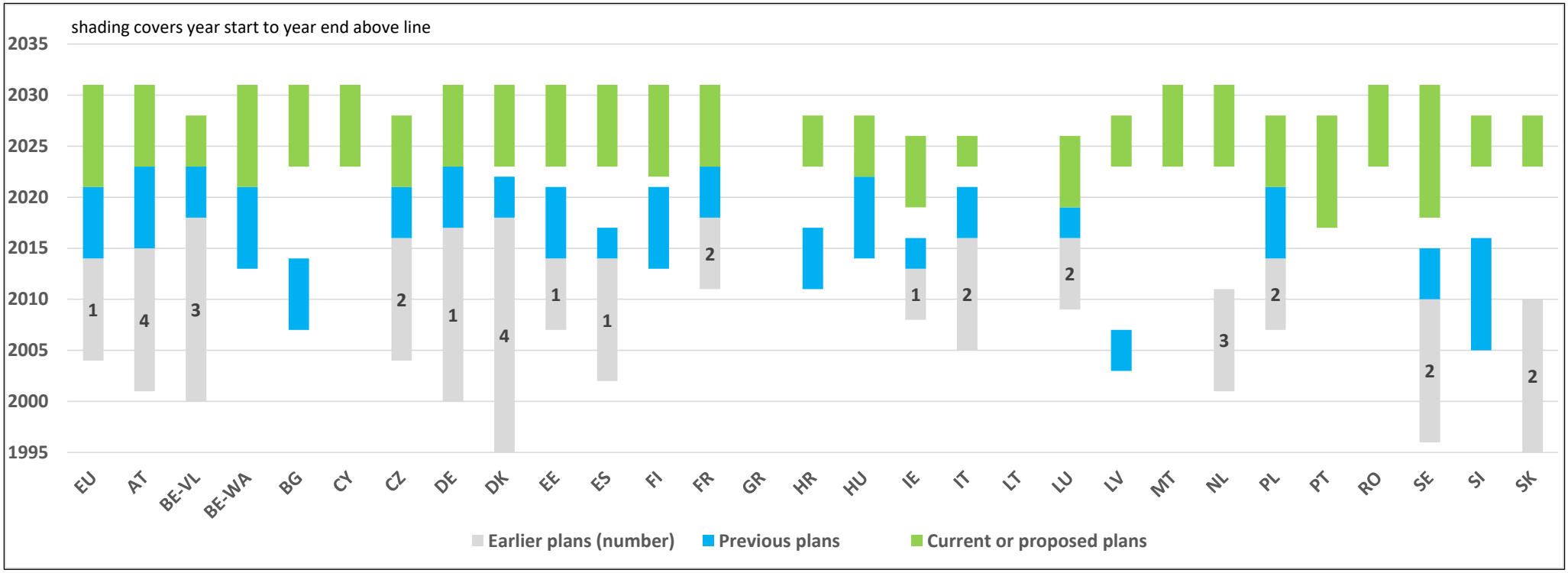


Figure 8 Number and period of Organic Action Plans in EU-27 MS

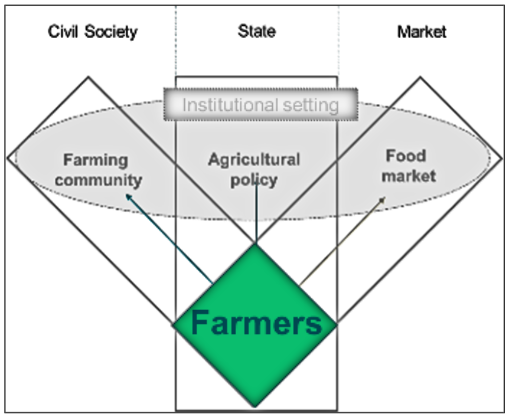
Source: Lampkin & Sanders, 2022; Lampkin et al., 2024.

3.3. Supporting and hindering factors of organic sector development

Although EU Member States share a common agricultural policy framework, EU countries also significantly differ regarding the velocity as well as status of the development of the organic sector. Evidently many more factors, including beyond just political aspects, hold responsible for the different organic sector development pathways in different countries. Building on a literature review, this chapter will provide an overview of key drivers behind organic sector development in EU Member States with a particular focus on factors behind sectoral lock-in. While the literature review serves as means to reveal broader patterns beyond anecdotal evidence visible only when combining the information from multiple cases, we will add country specific information from EU Member States, and especially from our study's focus countries (covered in further detail in chapter 3.4) that stand behind the pattern and are either particularly illustrative or mark an exception from normal. Following Michelsen's institutional framework along the three institutional domains relevant for organic farming (farming community, policy, market; see Institutional approach to organic sector development) and across three distinctive levels, this section will provide an account of the key supporting and hindering factors of organic sector development that are discussed in literature. Covering different sectors such as dairy, vegetables or fruits as well as mixed farming and including particularly challenging branches, such as poultry or pigs, we will briefly introduce and explain sets of impacting factors and sub-factors. In this effort we will pay head to country (cluster) specificities, where suitable.

3.3.1. Farmers: individual to systemic drivers

There is a large amount of literature dealing with different supporting and hindering factors behind conversion to or back from organic farming from an individual or personal farmer perspective as well as farmer systemic perspective.



Key **farmers' characteristics** identified as explaining why farmers convert to, maintain or drop-out from organic farming are:

- Age of farmers
- Education level
- Farm size
- Type of farm
- Off-farm income
- Intensity of production system
- Time span of farming organically

Although certain farmers' characteristics seem to impact on the likelihood of converting to or dropping out of organic farming in straightforward ways, the same factors may in fact also play out to the contrary, e.g. when combined with other factors or applied to specific country contexts (see Table 5. Farmers' characteristics behind conversion to organic farming or drop out).

Table 5. Farmers' characteristics behind conversion to organic farming or drop out

Hindering factors for organic farming		Supportive factors for organic farming	
For conversion	*Leads to drop-out*	*For conversion*	*Prevents drop-out*
• Advanced age • Young age & preference for mechanisation *(Latvia)* • Farm intensity *(Germany, Hungary)*	• Advanced age • Part-time with high compliance burden	• Young age + open to sustainability *(Hungary)* • Better educated • Small size + inefficient operations • (Small size) + off-farm income • Big size farms + high efficiency *(France)* • Extensive farming *(Austria, Romania)*	• Extensive knowledge of organic methods • Steep learning curves (first 6 years) • Off-farm income • Direct marketing for intensive farms • Extensive farming *(Austria, Romania)*
References			
Canavari et al., 2022; Király et al., 2022; Mala & Maly, 2013; Ti et al., 2020	Heinze & Vogel, 2017; Sahm et al., 2013	Agrárminisztérium, 2022 , Canavari et al., 2022; Girip, 2020; Jelocnik et al., 2015; Karipidis & Karypidou, 2021; Latruffe & Nauges, 2014; Sauer & Park, 2009	Darnhofer et al., 2019a; Girip, 2020; Jelocnik et al., 2015; Heinze & Vogel, 2017; Sauer & Park, 2009

Beyond that, some authors suggest a key difference in attitude between "old and new" generations of organic farmers. Younger generations hold fairly different profiles – lower environmental awareness, larger, more specialized and intensified farms, less education and more pragmatic business orientation – than their "pioneering" counterparts (Best, 2008; Bjorkhaug & Blekesaune, 2013; Flaten et al., 2006). Such differences between established and converting organic farmers may, however, be far less decisive, at least in some countries (Padel 2008). Still the impression is that farmers' personal drivers matter for understanding why they convert, or not.

Farmers individual drivers

What exactly drives the individual farmer to take up or maintain organic farming practices receives high attention in the literature. Those considerations cluster around the following themes and research interests (for details see Figure 9):

1. Social, economic, environmental motivation or ambition for/against organic
2. Types of prevailing values and identities of organic vs. conventional farmers
3. Relevant beliefs about the (non)feasibility of organic farming
4. Individual willingness to take risks /to transform farming activities

Bearing in mind the role of systemic or group related drivers (e.g. 'farmer community') Figure 9 summarises different ideas in literature about key individual drivers and key 'forcing' aspects.

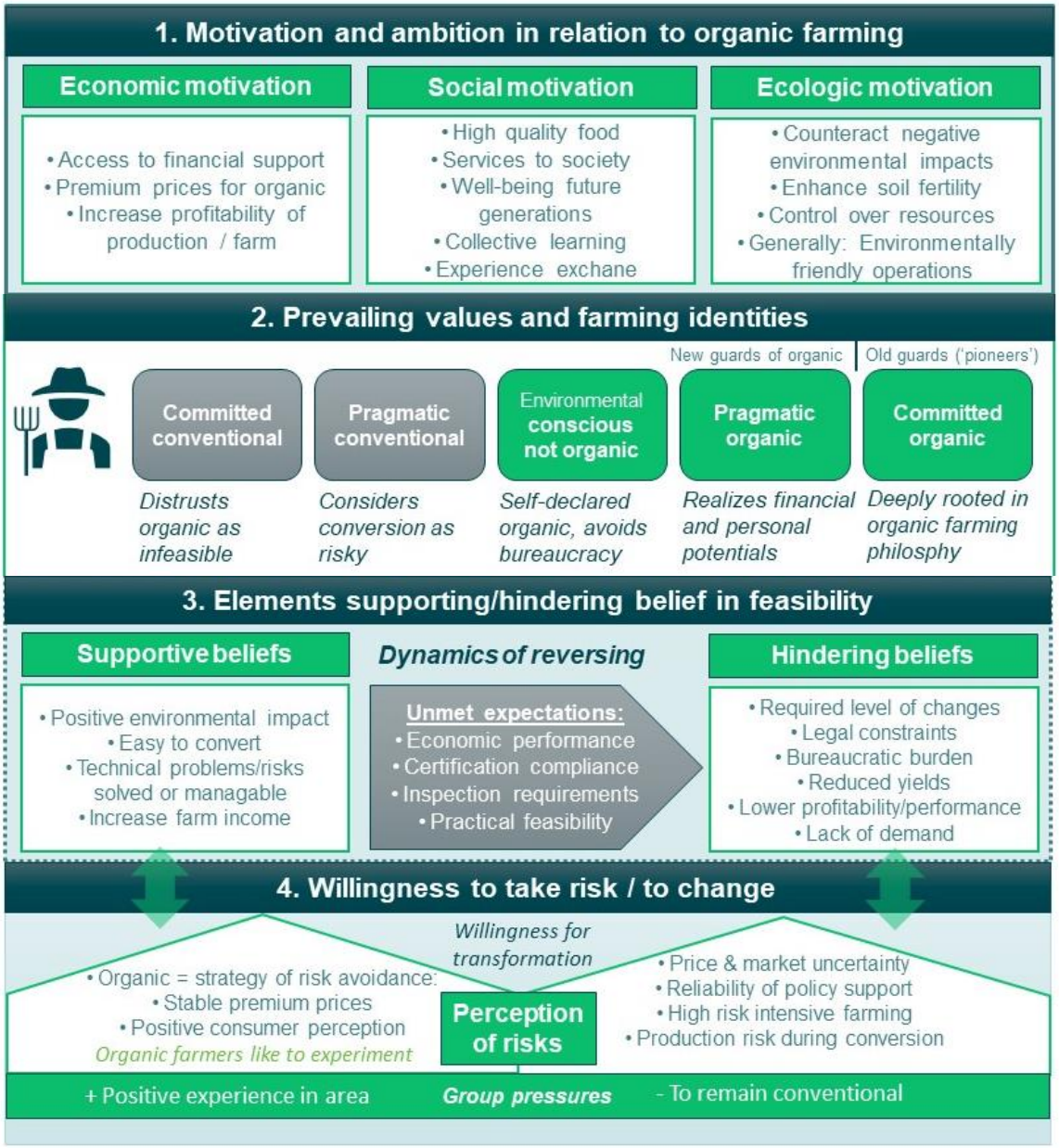


Figure 9 Core concepts of farmers' individual drivers for and against organic farming

Source: Based on Jahrl et al. 2023

The drivers highlighted in Figure 9, are often preceded by farmers' increased awareness of the need for changes in the farming system. Alterations in farming conditions (e.g. sudden change of input prices) and concerns about the consequences of conventional farming practices (e.g. animal health problems, reduced soil fertility) encourage the search for alternative farming systems (Darnhofer et al., 2005; Karipidis & Karypidou, 2021).

Systemic drivers at farm level

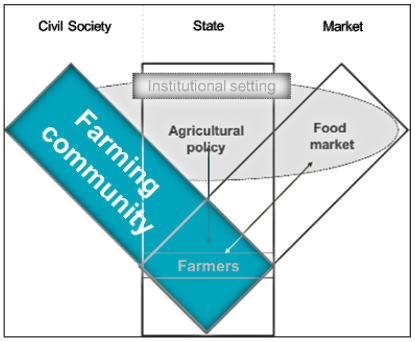
Beyond personal aspects of farmers, there are various more systemic factors to consider at farm level that matter from a farmer perspective as elaborated in Table 6:

Table 6. Overview systemic factors at farm level

Systemic factors at farm level	
Site / region	*Community*
• Landscape effects (e.g. less production favourable sites → organic) • Regional effects (e.g. supporting mechanisms 'in place', agglomeration effects, climate change)	• Trustworthy leaders (role of pioneers for initiation & diffusion) • Peer networks (esp. high organic share neighbourhoods)
Technicalities	*Knowledge*
• Availability of organic inputs, fertilizer, feed, seeds, robust breeds etc. • Dependence of imports • High feeding costs	• Access to education, extension and advice, e.g. "conversion check" service • Peer-networks & committed advisors • Coordinated /centralized knowledge processing /training for advisors
Policy support	*Marketing*
• Perceived 'reliability' of policy & legislation → risk perception • Regulatory constraints, complicating farm management (volatility, high bureaucracy, costs of certification etc.) vs. • Supportive regulation (marketing, trade, subsidies)	• Access to organic markets: adequately developed market structures • Price premiums • Marketing networks

Source: Jahrl et al., 2023

3.3.2. Farming community



Apart from considering the individual farmer's perspectives, the farming community matters also in structural terms for conversion and maintenance of organic farming, concerning:

i. Support structures provided for extension, advice, education and training (see Table 7)
ii. More or less powerful relationships vis-à-vis mainstream institutions (farming associations, certification, discourses).

Table 7 Support structures of the knowledge and innovation system (AKIS)

Support structures of the knowledge system		
Extension and advice	Education and training	Research and development
Diversity of organisational structures: • Publicly funded • Free on-farm advice • Self-help groups • Commercial expert consultancy • Retailer service *Limiting /enabling aspects*: • Secured funding • Coordination & cooperation • Quality • Efficiency	*Knowledge basis for:* • Farmers • Advisors *Limiting /enabling aspects*: • Available organic farming curriculum at secondary, high-school, university levels • Up-to-date knowledge & exchange with research	*Knowledge basis for:* • Development of /innovation in sector *Limiting /enabling aspects*: • No/little investment in research (large targeted research programmes) • Missing innovation capacity in research (e.g. input substitution, new organic products) • Practice oriented research instituted

Source: Jahrl et al., 2023

Organic farming associations are key players for representing farmer's interests politically, through lobbying and advocacy. They provide decisive extension and education services and support marketing, often through their own organic labels (Jahrl et al., 2016). Participation in organic farmer associations was found to be important for 'organic identity' building as for staying with organic farming. Still the number of farmers organized in associations is declining the more farmers gain independence in established markets. While some countries (Romania, Bulgaria) never had or gradually lost (Austria) their powerful positions for sector development (Jahrl et al. 2016), Organic Denmark managed to build strong relations with market actors (Daugbjerg & Schvartzman, 2022).

Overall, (third-party) inspection and **certification systems** are well-established in numerous European countries (Vairo, 2007) and are a supportive means for trading organic products. However, especially for small businesses certification comes with a high bureaucratic and financial burden (Home et al., 2017). Being increasingly criticized for undermining self-regulation, 'conventionalisation' of organic farming, or reductionism to a narrow set of practices that are easy to document, measure and control, alternative approaches like Participatory Guarantee Systems (PGS) in France or state-based certification and labelling systems, like the Ø-label in Denmark are gaining traction.

Prevailing farming discourses influencing organic farming development

Mainstream farming institutions had and continue to have a strong supportive or obstructive influence on the development of organic farming. Those attitudes are framed by prevailing policy discourses. Literature highlights some examples:

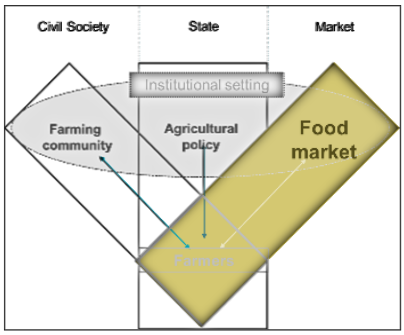
- **"grow or go"** - (e.g. German Farmers` Association) expressed in rejection of stronger ecological standards for farming and corresponding discreditation of organic farming as unproductive and costly (Heyen & Wolff, 2019).
- **"modernisation"** paradigm (e.g. France, Austria) stresses increasing productivity through pesticides & mineral fertiliser; opposing organic farming as backward or sectarian

practice. Rejection of organic farming less radical in Austria, due to policy goal of securing farms in less-favoured areas through organic farming with positive effects on tourism (Darnhofer et al., 2019a).

- However, with increasing public pressure towards the modernisation discourse, the "**agroecology**" discourse (esp. France) as well as "**local**" discourse (France and Italy) competing with "organic" for the attention of environmentally and health-conscious consumers. In France conventional community claims "local" discourse to escape debates on production practices and use of pesticides.

3.3.3. Food market

The functioning of organic markets and of market mechanisms on both the supply and demand side contribute heavily to organic sector development (see overview Figure 10). Overall, well-established market structures for processing and distributing organic products are of high importance for the development of the organic sector.



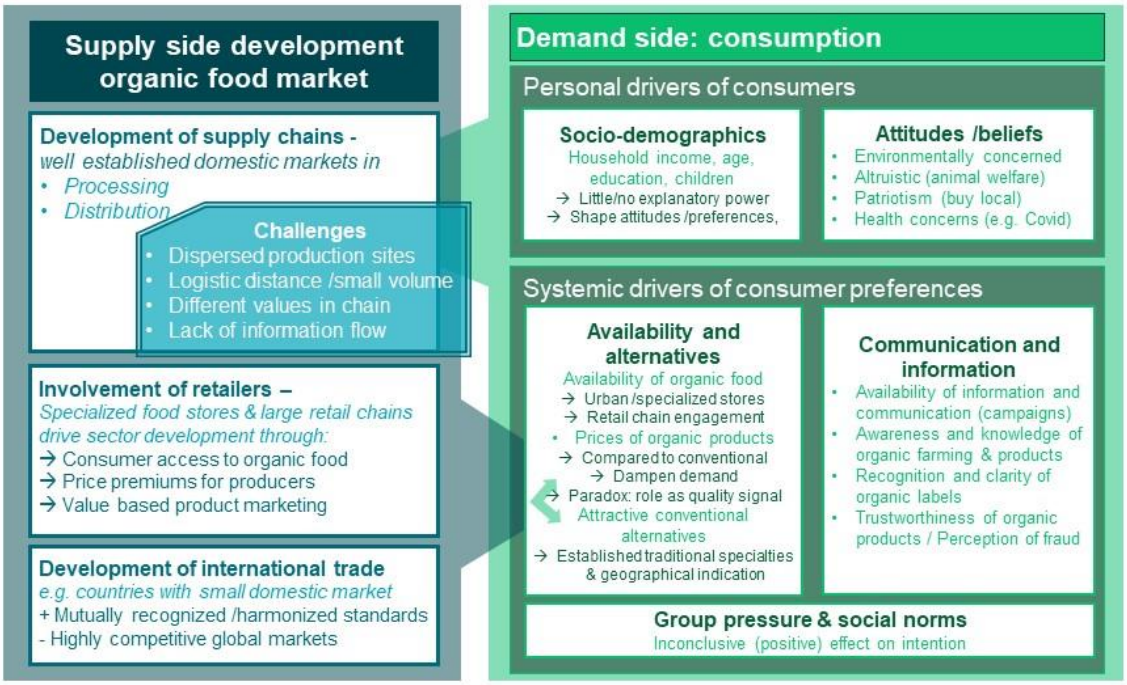


Figure 10 Food market-based drivers of sector development on supply and demand side

Source: Jahrl et al. 2023.

In this context, specialised food stores and especially large retail chains fulfil a key role as shown for diverse European countries (e.g. Austria, Denmark, Sweden, Switzerland, UK, Czech Republic). They may exert influence on the sector by launching own product lines or brands and aligned marketing and communication strategies. In countries with immature domestic organic food

markets, by contrast, international trademarks are a key driver for how much land is farmed organically.

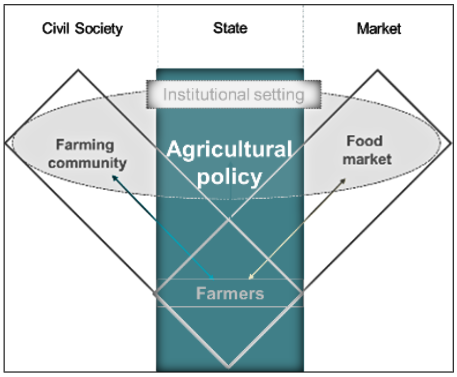
On the demand side of the supply chain, consumers with their preferences and purchasing behaviour towards organic products play a critical role. Consumer demand is also of key interest for both food industry and policy measures, e.g. demand-pull strategies as practiced in Denmark. At the *personal level*, various socio-demographic characteristics repeatedly emerge in studies as determinants of consumers purchasing behaviour. However, socio-demographics like household income, age, gender, education level or household size alone lack explanatory power. Still, they shape core attitudes, motives and preferences impacting on organic food purchasing behaviour together with factors such as the willingness to buy (Fortea et al., 2022), which is linked to attributes associated with organic food, e.g. high quality of organic food (e.g. Hungary, Nathan et al., 2021), and thus specific consumer values or attitudes highlighting the own health or the environment (Katt & Meixner, 2020).

At a more *systemic* level, consumer purchasing behaviour is influenced, among other things, by the **availability** (Katt & Meixner, 2020; A. Kowalska & Bieniek, 2022) as well as the **pricing** of organic products (Aschemann-Witzel & Zielke, 2017; Pawlewicz, 2019) especially as compares to alternative, i.e. conventional, products, which may be attractive in their own way (e.g. traditional specialities, geographical indication, Darnhofer et al., 2019).

As regards **raising awareness** of consumers towards organic food, transparent and informative communication is considered key, but is also often lacking or failing to improve the knowledge and recognition of organic labels (Zander et al., 2015), adding to distrust in organic production as well as in labelling (Richter, 2004). Consumers need **confidence in certification systems** and that standards are consistent with their expectations and preferences (Janssen & Hamm, 2012; Zander et al., 2015). However, labelling does not always help building consumers' trust that production was fully organic or certification processes unflawed, irrespective of whether certification or labels are public or private, or products sold in supermarkets (Buder et al., 2014; Darnhofer et al., 2019; Niva & Kujala, 2004) Many different organic labels confuse rather than inform consumers about organic farming or production (Latruffe et al., 2013; Zerger et al., 2005; Zander et al., 2015). While public logos have been reported to have difficulties in reaching consumers (Richter, 2004), most countries with high organic market shares actually rely on one national label with high consumer recognition (e.g. Denmark or Sweden; Hamm, 2002).

Intensive **advertising campaigns**, such as in the late 1990s in Austria, can also result in greater public awareness of and therefore demand for organically produced food (Nicholas et al., 2007). In addition, social norms or peer pressure may exert a positive effect on the behavioural intention for buying organic food (Aertsens et al., 2009), like in Denmark (Hansen et al., 2018), but also work the opposite way (e.g. Italy Testa et al., 2019).

3.3.4. Agricultural Policy



Political recognition of organic farming through state organic standards as well as policy support has been identified as an initial key for the development of organic farming (Michelsen 2001a). In earlier CAP periods, the European Commission (EC) has set the overall support framework for organic farming, within which Member States were obliged or encouraged to implement respective measures. As covered in 3.2, the EC has launched a plethora of policy strategies, programmes and instruments in support of organic farming. Their effectiveness and impact was the subject of various studies (Sanders et al., 2011). In this respect, the overall policy 'identity' or approach to fostering organic farming may be distinguished from the actual policy actions and support to foster organic farming in the countries.

Policy frameworks: path dependence and political commitment

From an overall policy framework perspective, the standing or value that organic farming is attributed to politically is highly relevant. It typically depends on how the issue was dealt with in the past or how related subjects are dealt with (path dependence). With organic farming being only one option (among others) under the agri-environmental and other measures of the EU rural development programmes, the overall EU policy approach appears too vague and maximally enabling, to be enforcing organic farming. Against this backdrop, nation states fit organic farming in with other policy objectives, that may or not put weight onto multifunctionality or rural development. While Austria's extensification policy strategy, for instance, fostered organic farming, policies in other countries, like Finland, remain geared towards conventional agriculture, supporting intensification and specialization (Lesjak, 2008).

In this vein, consistent **policy commitment** and reliability towards organic farming are key for sector development (Sanders et al., 2011; Darnhofer et al., 2019; Daugbjerg & Schvartzman, 2022) as expressed in stable support instruments and measures based on overall long-term (ambitious) policy goals, like e.g. Austria's ambition to be 'number one in the EU' (Darnhofer et al., 2019). Clearly, commitment depends on government officials in charge and their numbers. In Denmark, ministers have used organic farming support policies to foster personal reputation and political capital (Daugbjerg & Schvartzman, 2022). Also, while in countries like Austria and Denmark the relations between organic farming institutions and the State are strong, they are described as passive for Italy, and reluctant and lacking continuity in France (Darnhofer et al., 2019; Daugbjerg & Schvartzman, 2022).

Policy action and support

Member States employ different approaches in supporting organic farming. The various forms of policy support and instruments are summarized in Table 8.

While there is generally consensus that policies should address both demand and supply side to significantly foster organic farming, the UK has followed a different approach by focusing on generous conversion subsidies, rather than market support (Nicholas et al., 2007). EU regulation was

key for fostering the multiplication of markets for products, standards, certification, and accreditation services that protect organic farming and safeguard consumers' trust. At the same time, a perceived over-regulation of standards at EU level may demotivate innovative actors, like processors (Zerger et al., 2005), whereas the variety and exceptions at national level risk lowering organic standards. Ambitious action plans are an expression of overall policy commitment especially where sufficient resources for implementation are available, as in the case of Denmark (Zilans et al., 2019), and goals and measures are clearly defined and approved, unlike for Italy's action plan reported in 2007 (Nicholas et al., 2007).

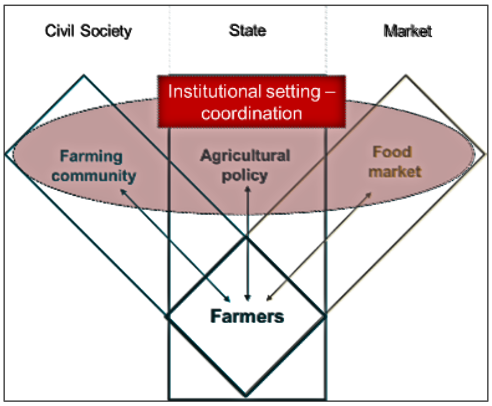
Table 8. Typology of relevant policy support and instruments for organic farming in the EU

<table>
<tr><th colspan="5">Approaches to policy support in the EU</th></tr>
<tr><th colspan="5">Relevant policy and support frameworks</th></tr>
<tr><td>Organic farming regulation</td><td>Action Plans/ National Strategies[c]</td><td>Standards</td><td>(Co)-funding approaches[d]</td><td>Alternative agri-environmental programmes[h]</td></tr>
<tr><td>• Council Regulation (EEC): option under rural development programme measures</td><td>• Definition of goals
• Overall targets on sector development</td><td>• National standards (e.g. DK, AT)
• Private standards of associations (e.g. Bio Austria).</td><td>• EU funded agri-environmental / organic measures (e.g. CAP Pillar 1)
• Measures co-financed by MS (Pillar 2)</td><td>• Support for agri-environmental alternatives
• Low input systems
• Agroecology</td></tr>
<tr><th colspan="5">Supply vs. demand side instruments[a]</th></tr>
<tr><td colspan="2"><u>Supply</u>:
Subsidies for conversion /maintenance
Tax incentives (e.g. VAT on production inputs)
Research and extension services</td><td colspan="3"><u>Demand</u>:
State operated certification /labelling system
Subsidies market research
Product innovation & marketing
Public procurement, capacities and facilities
Tax incentives (VAT on organic products)
Awareness: campaigning, awards etc.</td></tr>
<tr><th colspan="5">Level-specific supply-side support measures</th></tr>
<tr><td>Regional support[g]</td><td colspan="2">Support payments for farming communities[f]</td><td colspan="2">Support payments at farm level[e]</td></tr>
<tr><td>Federal state support systems
Eco-regions (e.g. Parc, Bio France)</td><td colspan="2">Institutional development beyond farm level:
Extension and advisory services
Support of organic farming associations</td><td colspan="2">Payments for conversion
Payments for maintenance
Decisive: continuity & value</td></tr>
</table>

Sources: a) Daugbjerg & Schvartzman 2022; Lampkin et al., 1999 ; b) Furtschegger et al., 2016; Nicholas et al., 2007) Lampkin et al., 1999; Sanders et al., 2011; d) Lampkin & Sanders, 2022 e) Cristache et al., 2018; Darnhofer et al., 2019; Lampkin & Sanders, 2022

Especially in the context of Pillar 2 payments under the CAP, several EU countries seem to lack capacity or overall political will to provide co-funding (Cristache et al., 2018). As for the UK, industry may have to 'jump in' to implement promotion activities for organic food and farming (Lampkin & Sanders, 2022). Great differences regarding the design and scope of policy support by different federal states (as in the case of Italy and Germany) may further impede the development of organic farming. By contrast promotional 'eco region' approaches – like the "Parc Bio" in France or "Bioregionen" in Austria – hold great potential for sector development (Saddier, 2003; Darnhofer et al., 2019).

In principle, measures that assure high enough funding for conversion and maintenance on a continuous basis and across the whole territory are key for farmers. France, for instance, stopped supporting maintenance due to budget constraints in 2018, whereas the UK offers the most generous conversion payments per hectare. The relative level of subsidies for alternative agri-environmental measures (like agroecology) determines how attractive organic production methods are to farmers. As in the case of Germany for 2007 (Nicholas et al., 2007) and Hungary (Agrárminisztérium, 2022), there may only be little differences between organic farming area payments and low input systems. While public funding matters for extension and advisory services or organic farming associations, it may spark detrimental dynamics when states gain control over the process and cause conflicts or weaken associations in representing farmers, as seen in Austria and France (Darnhofer et al., 2019; Jahrl et al., 2016). Still, national differences in policy measures may only insufficiently explain different organic sector growth rates (De Cock et al., 2016).



3.3.5. Cooperation and coordination between actors

For the development of the organic sector the interrelationship of farmers with their institutional environment is a key factor. They point to different ways of cooperation and coordination (or not) between actors across the supply chain and in policy and advocacy, as well as to the possible underlying power dynamics (Michelsen, 2001a).

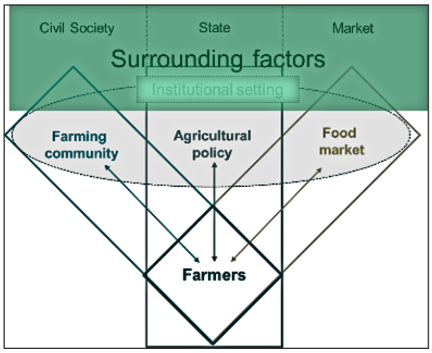
Overall a lack of cooperation and coordination between actors across the **value chain** hamper organic sector development. The Danish Organic Food Council is a telling example for institutionalising close collaboration of the organic industry, including organic farmers and their interest groups, with public authorities in support of the growth of the organic market (Daugbjerg & Schvartzman, 2022). By contrast, producer organisations in Germany broadly lack coordination with other market actors, and communication difficulties pertain in Italy along the whole supply chain (Mipaaf, 2016; Nicholas et al., 2007). Producer cooperation and market coordination is also absent from the recent action plan for Hungary (Agrárminisztérium, 2022).

At a higher political level **cooperation in policy and advocacy** plays a critical role for the path that organic sector development may take. Where organic farming associations manage to build alliances with or even being an integral part (e.g. France) of established, conventional farmer associations, the legitimacy of organic farming may be significantly strengthened as seen in Austria,

that managed to establish organic as just another way of (traditional) farming (Daugbjerg & Schvartzman, 2022, Darnhofer et al., 2019).

Nonetheless, **power imbalances** especially between retailers or large supermarkets with their contractors further 'down' the value chain may dramatically weaken the power of organic farmer association in sector development (Jahrl et al., 2016; Luczka et al., 2021). By contrast, Denmark Organic as association of organic companies, farmers and consumers exerted their 'power' mainly through capacity building rather than setting the economic conditions for contractors in terms of size of batches, margins, price levels, payment terms or standards (Daugbjerg & Schvartzman, 2022). Along similar lines and resting in a relationship of mutual trust and open communication, small suppliers and major retailers allows for collaborative planning and reciprocal advantages in Finland (Kottila & Rönni, 2008; Orsini et al., 2020).

3.3.6. Factors surrounding organic farming



Beyond factors that very concretely relate to organic farming, supply chain development or agricultural policies there are numerous more general factors that relate to the state, overall market development and society at large. Figure 11 gives an overview of those forces at play at the macro level in support of or hindering organic sector development.

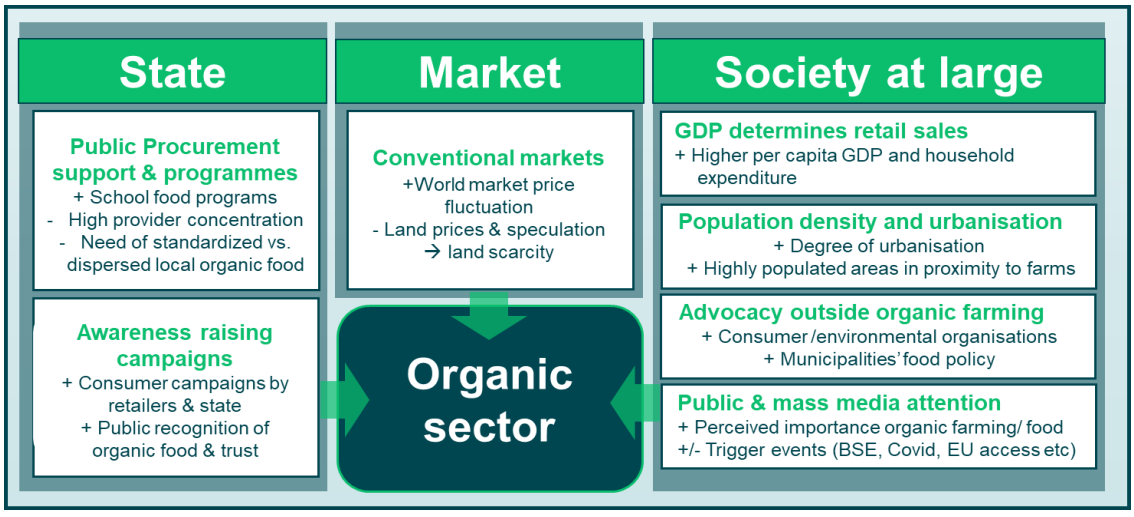


Figure 11 Surrounding factors at macro level impacting on organic sector development

Source: Jahrl et al. 2023

3.3.7. Additional factors

Beyond the factors reviewed in this chapter, the experts engaging in the OrganicTargets4EU consortium have highlighted additional factors during an internal workshop that add to the body of literature and provide insights into recent relevant discursive, political or power dynamics as well as technical or organisational matters:

Table 9. Additional supportive and hindering factors highlighted for focus countries

Additional factors in country contexts	
Supportive	*Hindering*
• Zero VAT for Organic (as discussed in IT) • Branding/free certification (DK) • Support high quality seed investment (RO, AT, FR) • Migration flow (IT)	• Advisors briefing against organic (DE) • Organic sceptical scientists (DE, IT) • Lobbying against organic (IT) • Ignoring internal diversity of organics (FR) • Lack of statistical data (data protection, DE) • Large number of certification bodies (DE and IT) • N shortage in arable systems due to disconnect of cropping & livestock system (AT, RO, FR)

Source: Jahrl et al. 2023

3.4. Organic agriculture in context: Focus country findings

In the effort to identify and elaborate on context-specific patterns for gaining a more nuanced understanding of how organic agriculture developed in practice in the EU based on the interplay of different relevant factors, we have grouped seven focus countries from the EU along the three categories: above average, average, below average. We have compiled country profiles that present insights on sector development and the factors behind it for each country of the countries along the same structure, sharing key figures, facts and insights about:

- The **Country's** general sector development trends seen since 1985 (production) or 2002 (sales) based on time series for both variables
- Agricultural **production structure and market dynamics:** individual patterns of growth in demand, consumption and highlighting also key structures in place in relation to marketing and certification
- **Key events** in policy, market and farming community specific to the country that stand behind a) area and b) retail sales growth, stagnation, or even recession
- **Agricultural policy and support**: highlighting the most relevant policy schemes and especially national action plans in place
- Structure, opportunities but also limitations of the national **AKIS** for organic agriculture, covering a) knowledge creation in research and innovation (e.g. at universities), as well as the systems in place for b) education and training and c) extension or consultancy on organic agriculture
- A **summary** of the country specific key **drivers**, lock-ins and barriers

3.4.1. Above Average: Austria and Denmark

Austria and Denmark represent distinct types of organic sector development because either a) the area of organic land (Austria) or b) the ratio of organic retail sales (Denmark) is significantly above EU average. We explore country specific dynamics behind their grouping 'above-average', while elaborating on specific events or processes, including political support and AKIS that provide hints as to why the sector developed on the supply and/or demand side.

Austria

In 2021 in Austria, almost 680,000 ha (26.5% of total farmland) were under organic management (FiBL, 2023). This means Austria was the EU country with the highest organic area share in 2021 and the only EU country to reach and exceed the 2030 target of 25%. After Italy, Austria also had the second highest growth (more than 7000% increase) in the 1985-2021 period and a CAGR of 27.8%. However, between 2001 and 2021 growth and CAGR were lower than in all other countries analysed here. In 2021, organic retail sales were valued at 2,937 million euros, i.e. 11.6% of the entire retail sales - the second highest value in the EU (in Europe, and Worldwide) (see Table 10).

Table 10. Key indicators organic sector development Austria, 1985-2021

AUSTRIA *Key indicators*	Farming area in ha			Growth of area		Compound annual growth rate CAGR	
Organic production growth	**1985** 5,880	**2001** 459,326	**2021** 679,119	**1985-2000** +7,199 %	**2001-2021** +48 %	**1985-2000** 33.1%	**2001-2021** 2.0%
	Share of farmland (%)			*EU average (in %)*			
	0.2%	15.7%	26.5%	*+3,063 %*	*+263 %*	*27.8%*	*6.7%*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001	**2021**		**2001**	**2021**	**2001**	**2021**
	30	84		*No data*	1,925	18,290	23,961
	Imports			**Retail sales million €**		**Retail sales growth (%)**	
		2021 (metric tons)		**2001**	**2021**	to **2021**: +965%	CAGR to **2021**: 12.6
		35,345		225	2,397 *(11.6% of total sales)*	*EU average +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

Agricultural production structure and market dynamics

The two main land use types in organic agriculture are permanent grasslands (57.71%) and arable land (40.49%) (EUROSTAT, 2023b). The organic sector in Austria holds a prominent position within the country's agricultural industry. The development of the organic sector in Austria has been fuelled both by early organic subsidies in 1992-1995 and consumer demand for organic products available to a wide range of customers in retail chains. In response to numerous food scandals in the 1990s, private and public trademark programmes were established and consistently operated as to build consumer confidence and trust in the organic sector. In Austria retailing structures are highly concentrated. Access to organic products for consumers and a generally high consumer awareness have nourished domestic market expansion.

Key events behind sector development in Austria

Bearing in mind that market data are collected consistently only since 2014 and that explanatory events may be missing for all market developments, Figure 12 illustrates the role of key events in policy (like the ÖPUL programme), food markets and the farming community in Austria.

- Area-related key events

Notable area growth occurred in **1992** and **1993**, following the establishment of the first subsidies for organic farmers in Austria in 1992. Vis-à-vis the 600% growth already seen in 1992, the launch of the first environmental programme ÖPUL in 1995 did not result in substantial further growth (decreases in **1995** and **1998**).

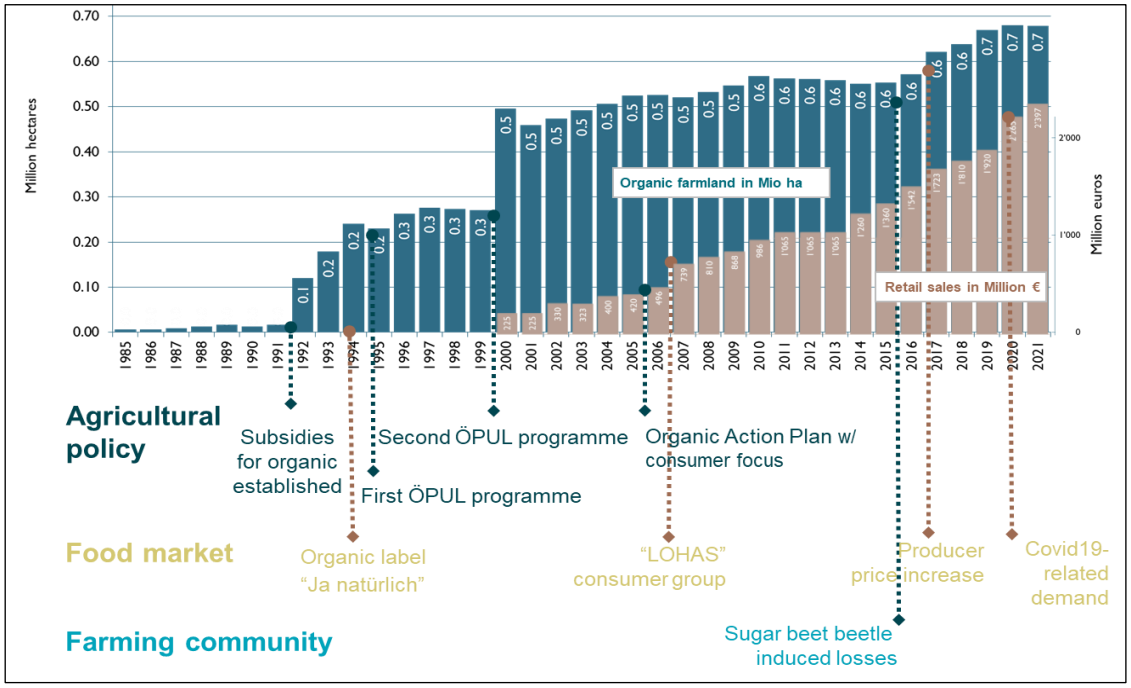


Figure 12. Key events in policy, market and farming for sector development in Austria, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

The launch of the second ÖPUL programme in **2000** resulted in a very substantial area growth, when the organic farmland almost doubled. Further programmes and action plans did not seem to have a massive growth effect. After **2000,** the area showed only small growth and even dropped in some years. From **2017** onward**,** notable growth occurred for which increased producer prices offer a convincing explanation. Adding to the dynamics was that several farmers in conventional sugar beet production transitioned to organic in response to the severe problems with the growing population of sugar beet beetle (*Bothynoderes punctiventris Germar*) seen in 2016 in dry regions of Lower Austria and Burgenland.

- Retail sales-related key events

On the one hand there is no explanation for the decreases in 2000 and 2003, the increases in 1999, 2002, 2004 as well as in 2014; on the other hand, the 2006 and 2007 increase may be linked to the launch of the Austrian organic action plan in 2005. Also, the launch of the organic label "Ja natürlich" of the Billa Supermarket chain in 1994 contributed to the market growth over the years. Another factor for the increase in 2007 was the emergence of the consumer group "LOHAS" (Lifestyle of Health and Sustainability), which sparked a growing demand for organic food during the ÖPUL 2007 period. The market growth seen in 2020 can be linked to the COVID-19 pandemic. In 2021 growth continued but not at the same pace as in 2020.

Agricultural policy and support

The Austrian policy environment (led by the Austrian Ministry of Agriculture as well as the Ministry of Health) can be described as highly committed and supportive for organic sector development. Although organic farming is still seen as just one among many options for agriculture to address

issues of conventional agriculture, Austria has followed a strong supply-push strategy focused at rural development and the maintenance of farms in less favoured areas with positive effects on tourism (Darnhofer et al., 2019). This approach is complemented more recently with (governmental and private) measures to promote demand through public procurement or awareness raising campaigns. Overall, stable support instruments and measures are in place with long-term (ambitious) policy goals, e.g. to stay 'number one in the EU' regarding the share of organic land as target in all Organic Action Plans (Darnhofer et al., 2019).

The straightforward implementation in Austria builds on ambitious and continuous action plans with defined resources. Table 11 reflects key aspects of the most recent organic action plan (OAP) compared to the previous OAP reaffirming as stronger focus on demand-pull measures for further market development.

Table 11. Key aspects of current (planned) vs. previous Organic Action Plans, Austria[7]

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2023-2030	30% (2027) 35% (2030)	n.a.	**150 M€ p.a.** (by 2027)
Previous OAP	2015-2022	20% (2016) More (2020)	100% of organic products sold as such	**150 M€ p.a.** /37% of all AECM[8] /+25% of ANC[9]
Number of prior OAPs (year 1st OAP)	**Retail market share** (2021)	**Organic area** UAA in 2021	**Main changes vs. previous OAP**	
4 (2001)	11.6%	26.5%	**Production:** Investment: *5% higher grants, priority (bio) calls, direct marketing startup support, focus environment / animal welfare*	
Main new subjects / goals in OAP				
Procurement: *Canteen food 22% by 2023 // 55% by 2030*	Export/trade: *Trade fairs, marketing campaigns*		**Markets:** Group action: *Support (short) supply chain co-operation;* Logos: *Strengthen AT/EU organic logos & use of producer brands*	
Tourism: *Bio regions, certified restaurants, advice&promo*	Certification: *5-year grants for certification, (conversion)*		**Information:** Advice: *Strengthen cross-regional advisory capacity; knowledge platforms; link research-training-advice;* Data: *more market, environmental, technical info*	

Source: Lampkin et al., 2024.

Complementary financial support (e.g. ÖPUL programme) assures that policy targets in OAPs gain practical relevance. More recent reductions of (certain) maintenance payments (Table 12) are to be seen in light of generally high rates and shifts toward supplementary payments, e.g. for biodiversity services.

[7] Approach to information in table: comparative content analysis of current vs. previous OAP across three core dimensions (and sub-dimensions/key indicators): **1) Production** (i. focus of area support, ii. investment (aid),); **2) Markets** (i. group action, ii. public procurement, iii. tourism (or gastronomy), iv. export/trade, v. logos/branding, vi. certification/market regulations; **3) Information:** i. consumer information, ii. advice/demonstration, iii. training education, iv. research and innovation (R&I), v. statistics. 'Main new subjects / goals in OAP' reflect new (or missing) subject areas not covered in previous OAP. 'Main changes vs. previous OAP' cover subjects that experienced an extension or more 'ambition', not suggesting that more ambition 'on paper' directly translates into implementation.

[8] AECM: Agri-environment-climate Measures

[9] ANC: Areas facing natural or other specific constraints (ANCs) are more difficult to effectively farm due to specific issues in relation to natural conditions.

Table 12. Comparison of planned (from 2023) and previous (2019) maintenance payments, Austria[10]

Reference	GAP Pillar	Grass-land	Arable	Vegetables, herbs
2023 (€/ha)	2	70-215	205-325	405-355
2019 (€/ha)	2	70-225	70-230	450-570
2023/2019	-	100% / 96%	89%	90% / 62%
	Protected crop-ping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	405	500- 700	700	n.a.
2019 (€/ha)	700-1000	700	700	n.a.
2023/2019	58%	100%	100%	n.a.

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

Despite their critical role for training and extension, organic farming associations have increasingly dealt with internal conflicts which lowered their influence on organic market development and weakened their position vis-à-vis the state and conventional farming sector (Jahrl et al., 2016). The government actively pushed the establishment of Bio Austria, but also organic farming associations to build alliances with conventional farmer associations to not forgo funding. While this strengthens the legitimacy of organic farming as another way of (traditional) farming (Daugbjerg & Schvartzman, 2022, Darnhofer et al., 2019) conventional farming remains the predominant farming practice for the majority of farmers in Austria with a key role in shaping the rules for the overall sector, accordingly – including for organics. To a certain extent, non-agricultural civil society actors from within the anti-GMO movement have contributed to the broad acceptance of organic farming in the country.

AKIS for organic agriculture

In Austria an experienced and well-established network exists, with potential to improve coordination, strategic focus, and specialized support. Overcoming these challenges requires targeted funding, improved coordination, and stronger focus on farmers' education, advisors' training, and integration of research and practice (see Table 13).

[10] Broad ranges rest in differences such as: stocking rates (grassland), lower rate for certain fodder crops /fallow (if >25% of arable area), herbs and flowers (vegetables) or nuts (orchards). Supplements are available e.g. for specific crops (like legume mixtures/grass or rare regional crops (120-250€/ha)) or biodiversity measures (e.g. mowing on steep slope).

Table 13. Support structures of the knowledge and innovation system in Austria

Key policy frameworks in support of AKIS		
• Austrian Rural Development Programme (ÖPUL 2014-2020)/ CAP Strategic Plan (2023-27) support / finance for advisory services & training programmes • Bio Aktionsprogramm (2023-ongoing): funding for education and advisory services.		
Research and innovation	**Education and training**	**Extension and advice**
• Well-established network of farmers, researchers, advisory, policy, industry • LEADER programmes & EIP-Agri projects foster AKIS	• Nationally coordinated & subsidized (50%) • Key providers: Organic associations; Rural Training Institute (LFI) • Agricultural colleges (e.g., Bioschule Schlägl) • 2-year MSc programme at University of Natural Resources and Life Sciences (BOKU)	• Jointly provided by agricultural chamber & Bio Austria (ARGE Bioberatung) • Across all regions.
Pertaining bottlenecks and (future) challenges		
• Outreach of research to farming practice (e.g. on-farm demonstrations)	• Lack of public funding • Teachers lack interest / understanding • Limited number of knowledgeable teachers • Lack of A-level track	• Insufficient funding • High administrative burden • Insufficient exchange with research • Advisors lack time for organic clients.

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in Austria

The retailers and policy commitment to sustainable practices, consumer demand for organic products and the presence of political support have been the main driving forces for the expansion of the organic sector in Austria. A set of early policy measures to promote conversion in remote and structurally weak places have helped organic agriculture to become a significant player in and well-integrated within the country's agricultural sector. The key driving force behind this development was policy rather than the weakened organic farming umbrella association. Still, well-functioning peer-to-peer-networks for capacity building among farmers have considerably added to this high share of organic farming in Austria.

Denmark

With 300,000 hectares (11.5% of total farmland) under organic management in 2021 (FiBL, 2023), the area grew by almost 3,500% and showed a compound annual growth rate (CAGR) of 26.8% between 1985 and 2000. Still, between 2001 and 2021 growth (+80%) and CAGR (+3.0%) was lower than the EU average (see Table 14). In 2021, retail sales were valued at 2,240 million euro. Between 2001 and 2021, the Danish market showed the third-highest growth after France and Austria. 13% of the retail sales were organic – the highest value in the EU (Europe / worldwide).

Table 14. Key indicators organic sector development Denmark, 1985-2021

Denmark *Key indicators*	**Farming area in ha**			**Growth of area**		**Compound annual growth rate CAGR**	
Organic production growth	**1985** 4,500	**2001** 168,372	**2021** 303,093	**1985-2000** +3,404%	**2001-2021** +80 %	**1985-2000** 26.8 %	**2001-2021** 3.0%
	Share of farmland (%)			*EU average (in %)*			
	0.2%	6.4%	11.5%	*+3,863 %*	*+263 %*	*27.8%*	*6.7%*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001		**2021**	**2001**	**2021**	**2001**	**2021**
	36		101	777	1,162	3,525	4,186
	Imports (metric tons)			**Retail sales million €**		**Retail sales growth (%)**	
	2001		**2021**	**2001**	**2021**	to **2021**: +730%	**CAGR** to 2021: 11.2%
	No data		61,737	270	2,240 *(13% of total sales)*	*EU average: +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

Agricultural production structure and market dynamics

The two main land use types in organic agriculture are arable land (83.08%) and permanent grasslands (15.72%) (EUROSTAT, 2023b). With 14.6%, bovine has the by far biggest share of organic livestock in all livestock. Imports play an important role to satisfy the growing demand for organic products in the country. Organic exports from Denmark accounted for approximately 15% of all Danish organic sales in 2021 (Bech-Larsen et al., 2023). Almost half of the exports go to Germany, followed by Sweden, and, at a distance, China[11], the Netherlands and France (Danish Agriculture & Food Council & Organic Denmark and Food Nation, 2023). The standard and well-respected labelling system supporting the organic market development in Denmark rests in a unique and broadly trusted approach of the Danish state overseeing both regulation and inspection. More

[11] Exports to China have recently experienced a considerable decline

than 95% of the Danish population knows and trusts the Danish organic label (red crown in the Øko symbol, Landbrug & Vodevarer, 2017).

Key events behind sector development in Denmark

Not all growth trends for Denmark, especially the decrease in the organic area between 2001 and 2005, can be related to (known) events in policy, markets or media. Further research needs to reveal the driving forces. The decline between 2012 and 2015 followed a general stagnation in (domestic) retail sales. Figure 13 highlights key events – e.g. action plans (organised by the organic movement with government support) – that contributed to the growth in both production and retails.

- Area-related key events

While there was a continuous growth of organic farmland, a particularly notable increase occurred in **1989** and **1991**, which can be linked to several (agricultural) policy-related factors: Denmark's first law on organic farming (1997) and the introduction of an authorised label for organic products (The Red Ø) in 1989. The first organic action plan was launched in **1995** when the organic farmland grew fast. Also, in 1**999** and **2001,** the area increased notably (in 1999, the second action plan was launched), which can also be linked to CAP support for conversion and maintenance. Notable growth between **2016** and **2019** is likely linked to the action plan and simultaneous start of the next CAP programming. The OAP included the goal to double the area by 2030. With the 2015-2020 RDP, Denmark had a specific organic support scheme in place for the first time. Previous support was mainly under agri-environment policy, e.g. zero N. The slow-down seen at the end of the RDP programming may be linked to the uncertainty about future policy as well as market conditions.

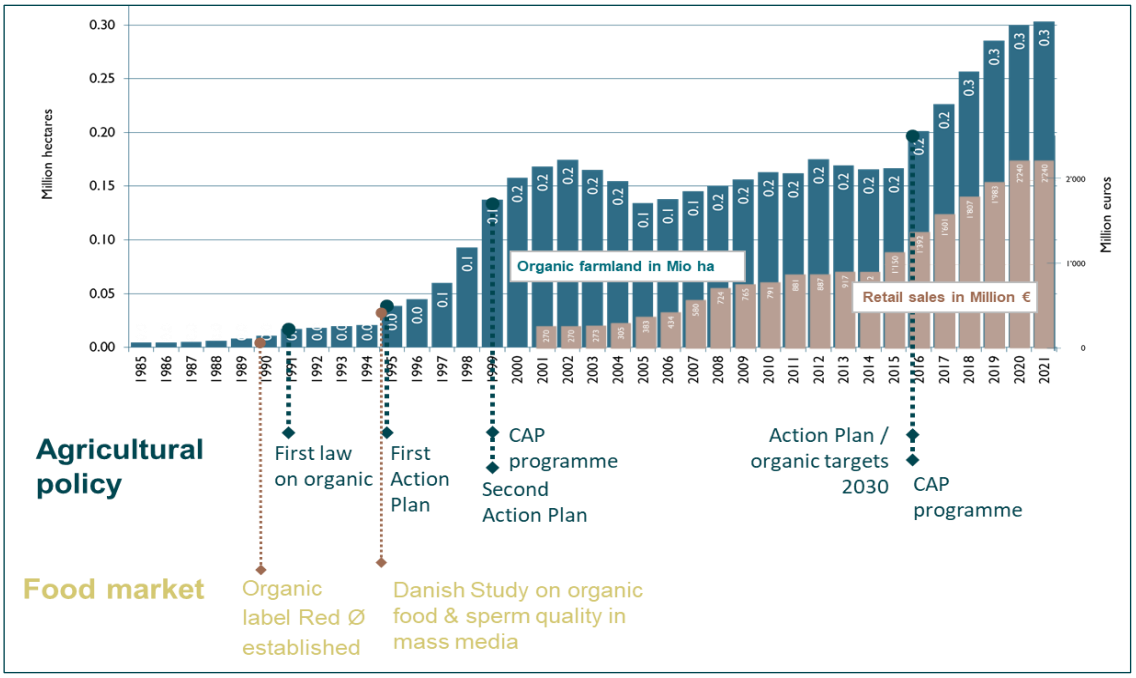


Figure 13. Key events in policy, market and farming for sector development in Denmark, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

In 1994, preceding the growth in 1995, a Danish study was published, which showed the connection between the consumption of organic foods and men's sperm quality. The study resulted in newspaper headlines worldwide. At the same time, media also brought attention to the role that agriculture played for fish starvation in the coastal fjords (due to eutrophication) as well as for elevated levels of agricultural chemicals in drinking water, which in Denmark is directly sourced from untreated ground water.

- Retail sales-related key events

The substantial increase in retail sales in various years (**1999**, **2005, 2005, 2007, 2008, 2015, 2016, 2020)** may be linked to the various organic action plans launched with a focus on consumer information. The increase in retail sales in **2005, 2006, 2007 and 2008** might be linked to the wider distribution of and lower prices for organic products. This focus on expanding affordable organic products, as exemplified with the slogan "Everyone can afford to buy organic" introduced by one discounter, significantly boosted organic consumption, according to the experts from Denmark. Another important development was the increased presence of organic food in food services and the launch of the 'organic cuisine' label in 2009.

A sentiment analysis of the coverage of organic food and food production in a major Danish newspaper suggested that the stagnation in retail sales in the early 2000s might have been due to organic having lost its 'novelty' status in combination with a less supportive media coverage (Thøgersen, 2006). The stagnation in the early 2010s may be linked to the finance crisis in 2008-2009 and that consumers put more emphasis on price (Thøgersen, 2010).

In 2021, the market stagnated, although organic was promoted a lot in canteens. The stagnation of retail sales (which excludes food service) might be owed to the fact that domestic consumption dropped in comparison to the exceptional COVID-19 year 2020 – a phenomenon that can be observed in many Member States. A positive signal for the sector was the creation of the Innovation Center for Organic Farming ICOEL (part of AKIS) in that same year.

Agricultural policy and support

In Denmark, organic farming is pursued as a goal in its own right, with the aim of making agriculture more sustainable. The state has taken a key role in developing and monitoring the national certification system. For increasing the organic area, it was also conducive that over the past 15 years conversion checks were free for farmers.

Table 15. Key aspects of previous (and currently planned) Organic Action Plans, Denmark

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2023/4-2030[12]	Not released /confirmed	n.a.	n.a.
Previous OAP	2018-2021[13]	More than 9.2% in 2017[14]	10.5% in 2017.	Farmer support at equal record levels: simpler & faster; extra biodiversity actions (>5ha)

Number of prior OAPs (year 1st OAP)	**Retail market share** (2021)	**Organic area** UAA in 2021	**Main subjects /changes in previous OAP**
			Production: Investment aid*: total 130 MDKK (ca. 17 M€) for Organic Farming*
4 (1995)	13.0%	11.4%	**Markets:** Procurement: [less emphasis], Tourism*: local markets (hotels, restaurants, etc.), gold standard catering,* Export*: market development as priority (focus China),* Logo*: in multiple languages (tourism),* Certification*: additional requirements (soil carbon, urban waste), recognition in China*
Main gaps in previous OAP[15]			
Group Actions: **Subject area not addressed**		Consumer Info: **Subject area not addressed**	**Information:** Advice*: Biodiversity /climate options, circular thinking;* R&I*: 25 MDKK funds (2018) for long-term research (e.g. sustainability, competitiveness, nutrient cycles and urban waste)*
Training: **Subject area not addressed**		Statistics: **Subject area not addressed**	

Source: Lampkin et al., 2024.

Overall organic action plans in Denmark have played an important role, typically being ambitious and with defined resources (see Table 16). Denmark has had 6 plans altogether with the earliest ranging back to the mid-1990s (1995-1998). As a result, the Danish plans are often more focused in depth on specific issues than action plans in other countries, and not covering the full range of possible policy options.

[12] Note: the content of the current OAP is not yet specified, its release only planned in Dec 2023. Rather than comparing the previous with an even older OAP, the table reflects the key corner stones but also possible blind spots in of the previous OAP. Updates to this document may be provided in 2024

[13] Originally one plan from 2012-2020, plans in 2015 and 2018 following changes in government

[14] Action plan refers to an increase compared to the position reached at the end of the previous plan 2017.

[15] Considering Denmark's evolved AKIS and supply chain cooperation, data gaps need not to be interpreted as actual issues to be addressed

Table 16. Comparison of planned (from 2023) and previous (2019) maintenance payments, Denmark[16]

Reference	GAP Pillar	Grassland	Arable	Vegetables, herbs
2023 (€/ha)	1	117/204	117/204	117/204
2019 (€/ha)	2	116/183	116/183	116/183
2023/2019	-	101/112%	101/112%	101/112%
	Protected cropping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	117/204	654/741	n.a.	n.a.
2019 (€/ha)	116/183	652/719	n.a.	n.a.
2023/2019	101/112%	100/103%	n.a.	n.a.

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

In Denmark exceptional structures of cooperation exist under Organic Denmark, the association of organic companies, farmers, and consumers. The coalition is not only strong but also balanced in power and forms the backbone of demand-side policy measures (Daugbjerg & Schvartzman, 2022). Together with the high purchase power and interest it works as an important means to prevent dynamics as seen in the early 2000s when numerous dairy farmers reconverted vis-à-vis deteriorating 'premium' prices for organic milk (Nicholas et al., 2007). Organic farmers have established close working relationships with policy actors and other interest groups within the Organic Food Council. The collaborative governance arrangements across both pillars of the Danish organic farming policy (Michelsen, 2001b) provided conducive conditions for integrating conventional with organic associations' interests in policymaking based on a shared understanding that organic farming forms an integral part of the Danish agricultural industry (Daugbjerg & Schvartzman, 2022).

Unlike in many countries, Danish (organic) farming associations are not responsible for certification or labelling. The national Ø-label is operated in full by the state, which also provides considerable subsidies for market research, product innovation and marketing (Daugbjerg, 2022). Since 2010, conventional farmers can draw on a free of charge "conversion check" to analyse the most likely economic consequences of converting to organic and provide professional advice on new equipment and production methods. This system indirectly strengthened the role of organic farming associations for capacity building, rather than for certification. Under those conditions, the Danish organic farming associations managed to form a coalition with a broad range of actors (incl., conventional farming actors, consumers).

AKIS for organic agriculture

Denmark's organic sector showcases a well-structured AKIS with strong collaboration, proactive farmer engagement and an outstanding collection of data and literature freely available for

[16] Payments are differentiated between high intensity (max 100kg N/ha inputs permitted) vs. low intensity operations (max 60kg N/ha permitted). The latter systems receive principally higher payments.

farmers. Challenges pertain in the areas of funding and knowledge exchange between research and extension (Details: Table 17). A targeted strategic approach, improved funding mechanisms, and enhanced integration could further strengthen Denmark's already effective organic knowledge and innovation system.

Table 17. Support structures of the knowledge and innovation system in Denmark

Key policy frameworks in support of AKIS		
• Since first Organic Action Plan (OAP, 1995) several national strategic policy papers, e.g. CAP Strategic Plan (on digitalisation): participatory /top-down mix of approaches in support • No separation of AKIS for organic farming from general AKIS structure		
Research and innovation	**Education and training**	**Extension and advice**
• Applied, accessible e-knowledge & collaboration • Main hubs: ICOEL (Innovation Centre for Organic Farming), Organic Denmark (Økologisk Landsforening), SEGES Innovation (conventional), advisory services, International Centre for Research in Organic Food Systems (ICROFS)	• 2-year MSc programme at Aarhus University • Curriculum / training programmes at the agricultural colleges (Landbrugsskolerne), supported by Agriculture and Food Council (LF). • Education programmes for farmers (ICOEL)	• Organic farming as separate, fully integrated part of portfolio. • Consultants available throughout country • Covering full spectrum of services (technical, financial, legal, marketing etc.) tailored to different target groups
Pertaining bottlenecks and (future) challenges		
	• Most agricultural trainings not for free; online access to considerable content	• In some regions organic conversion no priority for services

Based on: Nagy et al. 2023.

Summary key drivers and barriers in Denmark

Denmark has the highest share of organic in retail sales and was one of the first countries where an organic standard and a respective labelling system, rules and public inspections system was put in place. This early, strong, and reliable logo in combination with an already existing consumer interest was supportive for market development in the country. The AKIS environment builds on a mixture of participatory and top-down approaches, where the AKIS for organic is well integrated into the general AKIS structure.

3.4.2. The Average: France, Germany, Italy

Organic agriculture is all but a new practice in France, Germany or Italy and goes back well before 1985. Still, the three countries may be best described as 'average' regarding the key indicators of sector development: share of organic area and/or retail sales. Remarkable differences exist, however, between them and a closer look at their individual pathways and specificities of driving and hindering forces offers interesting insights. While France and Germany had similar points of departure (0.2% area in 1985) and both showed average values in 2021, they took fairly different routes to this point. France started with just a modest growth turning into accelerated growth more recently. By contrast Germany's growth rates were well above average until 2000 and slightly slowed down until around 2015 when growth gained momentum again. Italy with a comparably high share of organic farmland (yet mainly for exports) is still just average in sector development when combining it with the low share in domestic retail. Our country specific considerations help shed light on decisive dynamics on both demand and supply side behind this overall mediocrity.

France

In France, more than 2.7 million hectares were under organic management in 2021, constituting 9.6% of total farmland (FiBL, 2023). Between 1985 and 2000 farmland grew by more than 722% representing a compound annual growth (CAGR) of 15.1% over the period from 1985 to 2000.

Table 18. Key indicators organic sector development France, 1985-2021

France *Key indicators*	**Farming area in ha**			**Growth of area**		**Compound annual growth rate CAGR**	
Organic production growth	**1985** 45,000	**2001** 419,750	**2021** 2,776,554	**1985-2000** +722%	**2001-2021** 561%	**1985-2000** 15.1%	**2001-2021** 9.9%
	Share of farmland (%)			*EU average (in %)*			
	0.2%	1.5%	9.6%	*+3,863 %*	*+263 %*	*27.8%*	*6.7%*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001	2021		2001	2021	2001	2021
	n.a.	662		5,400	19,311	10,364	58,413
	Imports			**Retail sales million €**		**Retail sales growth (%)**	
	2001	**2021** (metric tons)		**2001**	**2021**	to **2021**: +1,001%	**CAGR** to 2021: 12.7
	No data	271,608		1,150	12,659 *(6.6% of total sales)*	*EU average: +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a).

With a higher point of departure in 1985 compared to many other Member States, France experienced one of the lowest growths in area and annually between 1985 and 2000. Still, growth between 2001 and 2021 (area: +561%, CAGR: +9.9%) was above EU average.

In France about 6.6% (or 12.7 million €) of the retail sales in the market were organic in 2021. Although relatively still behind countries like Denmark or Austria the French market was not only

the 2nd largest European organic market in absolute terms in 2019, it also showed the most vigorous growth among all focus countries between 2001 and 2021. After 'ups and downs' in the early 2000s, it grew continuously since 2005 (see Table 18 & Figure 14).

Agricultural production structure and market dynamics

The two main land use types in organic agriculture are arable land (57,27%) and permanent grasslands (34,66%) (EUROSTAT, 2023b). Regions with the greatest area under organic farming in 2019 in France – all with a comparatively low level of crop farming – are: Pays de la Loire, Bourgogne, Nouvelle Aquitaine, Auvergne Rhône Alpes, Occitanie. The organic sector is a significant export market generating 826 million euros (Taste France for Business, 2023). Specialized organic grocery stores are a very important way of distribution in France and short supply chains and direct marketing (e.g. box schemes) are well established, especially for organic fruits and vegetables. While larger chains for, e.g. beef, cereals or milk, have experienced market problems in the past (Nicholas et al., 2007), low world market prices for conventional dairy, beef and pork (and high prices for inputs) favour organic production. Only more recently there is a considerable market growth (see Figure 14) ascribed to public demand-pull strategies (e.g. procurement) as to discursive shifts in the (conventional) agriculture community highlighting the economic viability of organic agriculture.

Key events behind sector development in France

While for the period up to 2000, there was continuous farmland increase, sometimes exceptional, the mid-2000s were characterised by decreases or stagnation, whereas from 2009, there was continued, sometimes exceptional increase.

- Area-related key events

The continued growth **1998-2003** can probably be linked to the "Riquois" development plan 1998 (Plan Pluriannuel de Développement de l'Agriculture Biologique, PPDAB), the first national development plan (followed by subsequent plans), which provided support for organic farmers. A further important event was the foundation of Agence Bio, with many promotional activities. The area loss from **2004-2007** is not linked to any specific event and may just reflect the insecurity prior the new CAP programming period starting in 2007. The creation of a tax credit for organic farming (2006), which could potentially have boosted organic agriculture, had only a limited effect. **After 2009**, continued exceptional growth was noted that can probably be attributed to the CAP rural development programmes, at least in parts. Even delays in payments (2015) or the removal of maintenance support (2017) did not seem to have had a negative effect on growth – which was probably triggered by the strongly growing market.

The **mid-2000s** (2004-2007) were a period of stagnation/decrease. One reason might be the creation of a so-called "mixed technological network" (RMT DévAB) aiming at developing the organic sector; it included 45 organisations from France. This network was followed by another RMT for organic processing (TransFoBio), which is still active. However, the attempt to merge conventional and alternative organisations supporting organic agriculture development has crystallised tensions between some parties. Regarding the area growth since 2009, additional factors with a positive effect might have been the increase in supermarket sales, the EGAlim Law (target of 20% of organic or local food in food service), or the launch of the programme of the National Institute

for Agriculture and the Environment (INRAE) on the scaling-up of organic farming. At least for the 2008 to 2012 period the French Organic Action Plan is suggested to have had a positive impact on area growth (Rees et al., 2023b).

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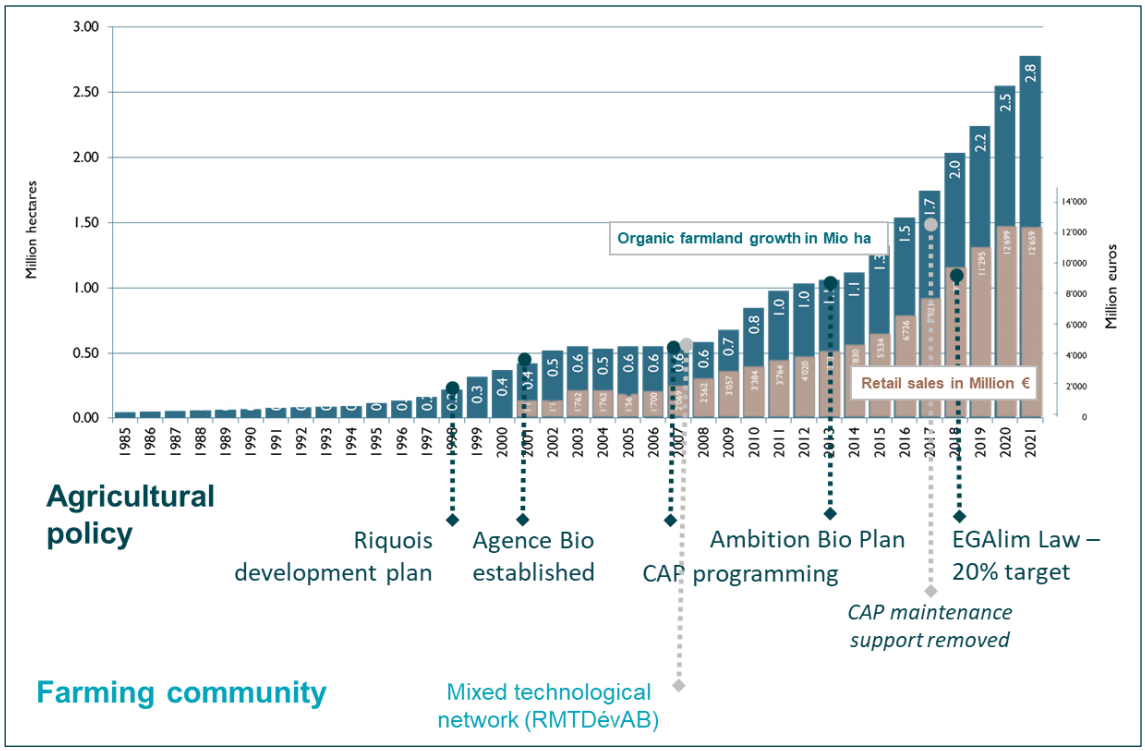

Figure 14. Key events in policy, market and farming for sector development in France, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

- Retail sales-related key events

It is difficult to link a particular event to the continued market growth; however, notable events are: The foundation of Agence Bio in 2001 with many promotional measures; the increased presence of organic food in public canteens/food services; the decrease in consumer prices for organic food since 2013, which is closely tied to the fact that major retailers in France (Auchan, Carrefour) have installed own inexpensive organic product lines and own labels.

In 2021, the organic market in France declined compared to 2020, when slightly above-average growth was noted due to COVID-19. The explanation for the decline in 2021 is that organic consumption decreased due to rising organic food prices and competition between organic farmers. Since 2021, there has been a decrease in organic food demand, a retraction of supermarkets, the closure of some specialised retailers, and an increase in farmers' withdrawal from organic agriculture. In 2022 (no consolidated data available), the market contracted again due to the Ukraine crisis and increasing prices.

Agricultural policy and support

Although organic farming is broadly addressed, a lack in policy continuity can be found, e.g. maintenance payments introduced in 2008 were temporarily abolished in 2018 (see Table 20).

Table 19. Key aspects of previous (and currently planned) Organic Action Plans, France

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2024-2030[17]	Not released /confirmed[18]	n.a.	n.a.
Previous OAP	2018-2022	15% (2022)	-	Increase production, funding awareness, group conversion; external contamination fund; access to land
Number of prior OAPs (year 1st OAP)	**Retail market share** (2021)	**Organic area** UAA in 2021	**Main gap in previous OAP**	
2 (2011)	6.6%	9.6%	Investment aid: **Subject area not addressed**	
Main subjects in previous OAP				
Markets: Group actions: *mobilise actors; consistency animal welfare & biodiversity ambition; synergies with development networks; engage stakeholder on market issues, regulations, research and support,* Procurement -**Target: 20% procurement**, *tools to facilitate contracts, supplies, best-practice,* Tourism: *increase commercial gastronomy use; educate trainees in catering /retailing,* Export: *export promotion, organic support in overseas territories (biodiversity impact); IFOAM World Organic Congress;* Logo: *AB logo vs. organic /environmental certification,* Certification: *'geolocating' for data exchange; adapt and implement EU regulations; annual meetings on farmer needs on health & plant protection regulations.*			**Information:** Consumer: *Campaigning & communication* Advice: *support producers; cross-cutting agency action; information access & peer exchange, databases & internet portals; awareness raising non-organic producers* Training: *Raise profile; integrate in sustainable production courses; Formabio-network oversight; materials for trainers & schools; provision for (conventional) farmers; organic in college farms;* R&I *strengthen R&D; stakeholder-led priorities; seeds & transplants; processing research; environmental impacts & remuneration; regional trials & dissemination (by ITAB); new mandate CSAB;* Statistics: *Agence Bio Info system ; obligatory data control bodies; national/ EU/ global organic market data: price & production cost data & distribution in value chain; strengthen regional observation centres.*	

Source: Lampkin et al., 2024.

Adding to the impression of imperfect or inconsistent policy commitment and inconsistency is the fact that the Strategic Plan (2019-2025) and "Contract of objectives and performance of the network" of the Chambers of Agriculture (2021-2025) seeks to now 'improve' support to organic farmers with activities that were basically omitted from the previous CAP period.

[17] Content of 'current' OAP not yet specified, release planned in 2024. Rather than comparing previous with older OAPs, table reflects key aspects and possible blind spots in the previous OAP and until 2022.

[18] As of CAP Strategic Plan France follows an area target of 18% of UAA by 2027.

There are still high variances in policy support across regions. With the Ambition Bio Plan (2013-2017) France aimed at doubling the organic surface of the country in five years, whereas the subsequent Ambition Bio Plan (2018-2022) wanted to reach 15% of organic area, but in practice reached only 10%. The objective for 2027 (18%) appears also rather modest compared to the EU of 25% of farmland under organic practice by 2030.

In line with the ambitions, the strategy drew on a budget of 1.1 billion for the period until 2022. It is flanked by the "Avenir Bio" structuring fund managed by Agence Bio which was increased from 4 to 8 million EUR per year. After maintenance support was stopped in 2018, eco-scheme payments under the second pillar of CAP currently support organic farmers with 110€/ha/year irrespective of practice (Table 20).

Table 20. Comparison of planned (from 2023) and previous (2019) maintenance payments, France[19]

Reference	GAP Pillar	Grass-land	Arable	Vegetables, herbs
2023 (€/ha)	1	110	110	110
2019 (€/ha)	-	0	0	0
2023/2019	-	-	-	-
	Protected cropping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	110	110	110	n.a.
2019 (€/ha)	0f	0f	0f	n.a.
2023/2019	-	-	-	n.a.

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

Organic farming associations in France are a diverse and sometimes conflicting community. Generally, the relationship between organic farming institutions and the State may be described as 'reluctant' and lacking continuity (Darnhofer et al., 2019; Daugbjerg & Schvartzman, 2022). This reluctance to support organic is grounded in a 'modernisation discourse' in favour of conventional agriculture practice until recently. However, organic farming communities compete with agroecological, as well as 'local', farming approaches. 'Traditional' specialities or products with 'geographical indication' draw on the attention of environmentally and health-conscious consumers.

AKIS for organic agriculture

The French organic AKIS has made significant progress in supporting the rapid growth of the organic sector in the last decade. The main strengths of the AKIS for organic lies in the interdisciplinary and cross-cutting institutional structure and the well-established bottom up collaboration of actors, including conventional farmers, but also the notable financial and technical support by the Chamber of Agriculture. However, challenges pertain in terms of funding for AKIS activities

[19] Maintenance payments initially available at start of 2014-2020 period, but were discontinued midway; only values for mainland France analysed.

or actors and concerning more effective knowledge sharing and advisory services. Knowledge exchange and coordination may be better coordinated and structured both online (e.g. through Tech'NBio), and at national and regional levels through hubs like CSAb (Climate Smart Agriculture booster) or respective grant schemes or research programmes (Synergy Programme, Metabio).

Table 21. Support structures of the knowledge and innovation system in France

Key policy frameworks in support of AKIS		
• CAP Strategic Plans, R&D programme in Ambition Bio Plans (2013-2017, 2018-2022) • 'Avenir Bio' structuring fund by Agence; Ministry of Agriculture CASDAR's Innovation and Partnership projects (12million euro, 2010-2020)		
Research and innovation	**Education and training**	**Extension and advice**
• Participatory, demand -oriented, 'bottom-up' • Exceptional networks: GIS (Groupement d'Intérêt Scientifique), RMT (Réseau Mixte Technologique), UMT (Unité Mixte Technologique), • Applied research Programmes: CASDAR to foster exchange of research-training	• Increase vocational/continuing education opportunities • Agricultural chambers aim at supporting >40,000 farmers • Fomabio: recognized network of public /private organic agricultural education • training schemes for advisors: RESOLIA for Agricultural Chamber.	• Advisory services meet knowledge needs (fee-based) • Number of advisors for organic farming increased • Some Regional Councils cover fees for service.
Pertaining bottlenecks and (future) challenges		
• Disconnect research (policy) and advisory services • Disconnect online knowledge-sharing platforms • Gap in practical research for trainers /extension services • Competition with conventional research for scarce funding	• Teachers' knowledge and attitude towards organic farming in high schools • Fomabio: limited human resources and updates on challenges of organic producers	• Gaps on relevant issues (e.g. marketing, processing) • Lack of staff /insufficient expertise • Farmers fees vary between regions /providers. • Lack of funds spurs rivalry between advisors & disincentivizes efforts to trainings, knowledge sharing, or facilitation

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in France

The more recent positive trend in area and market growth in France can be related to pro-active demand side policies, an increased consumer interest and the shift away from the economic modernisation discourse in the agriculture sector. It is still to be seen whether these new dynamics are strong enough for sustained growth seeing the persistent barriers stemming from a lack in policy commitment, fragmentation of and conflicts among farming associations or low support for innovation in agricultural research. Moreover, Agroecology as a strong movement in France

directly competes with organic. The same applies to relevant food labels of 'traditional specialities' or 'geographical indication'.

Germany

Organic farming has a long tradition in Germany with a sustained growth in land area in the last decades. Still, with an organic land area of approximately 11% of UAA, the country ranges only slightly above EU average (FiBL, 2023). In comparison to many other countries, the organic area grew in Germany at a fairly steady and higher rate than EU average until 2000 (compound annual growth rate of 22.8%). Germany is also the only country analysed showing stagnation (increase below 1 %) only once for both area (2014) and retail sales (2009). This puts into perspective why growth rates are generally below EU average for both indicators between 2001 and 2021 also considering that Germany started at a 'higher' initial level in 2001. Retail sales growth tends to be below EU average. Still, Germany is the biggest markets for organic in the EU in terms of total volume, however not in share (7% vs 13 % in Denmark).

Table 22. Key indicators organic sector development Germany, 1985-2021

Germany *Key indicators*	Farming area in ha			Growth of area		Compound annual growth rate CAGR	
Organic production growth	**1985** 24,940	**2001** 634,998	**2021** 1,802,231	**1985-2000** +2,089%	**2001-2021** +185%	**1985-2000** 22.8 %	**2001-2021** 5.4%
	Share of farmland (%)			*EU average (in %)*			
	0.2%	3.7%	10.8%	*+3,863 %*	*+263 %*	*27.8%*	*6.7%*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001		**2021**	**2001**	**2021**	**1985/2001**	**2021**
	395		2,016 *(*5.1)*	4,652	19,536	1,610/14,702	36,307
	Imports *(metric tons)*			**Retail sales million €**		**Retail sales growth (%)**	
	2001		**2021**	**2001**	**2021**	**to 2021**: +488%	CAGR to **2021**: 9.3%
	No data		517,183	2,700	15,870 *(7.0% of total sales)*	*EU average: +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

Agricultural production structure and market dynamics

The two main land use types in organic agriculture in Germany are arable land (47.61%) and permanent grasslands (50.85%) (EUROSTAT, 2023b). Across Germany, large supermarkets (Lidl, Aldi, Edeka, etc.) and drug stores (like dm or Rossmann) have established own assortments for organic products. In this broadly growing German market for organics the established system of specialized organic grocery stores is steadily declining while shorter organic food supply chains or possibilities for smaller businesses to cooperate (locally) offer additional sales opportunities. Still, there is a perceived lack of coordination among market actors from producer to consumer.

Traditionally, a high percentage of the organic food purchase is handled in specialised organic food stores (Darnhofer et al., 2019; Jahrl et al., 2016).

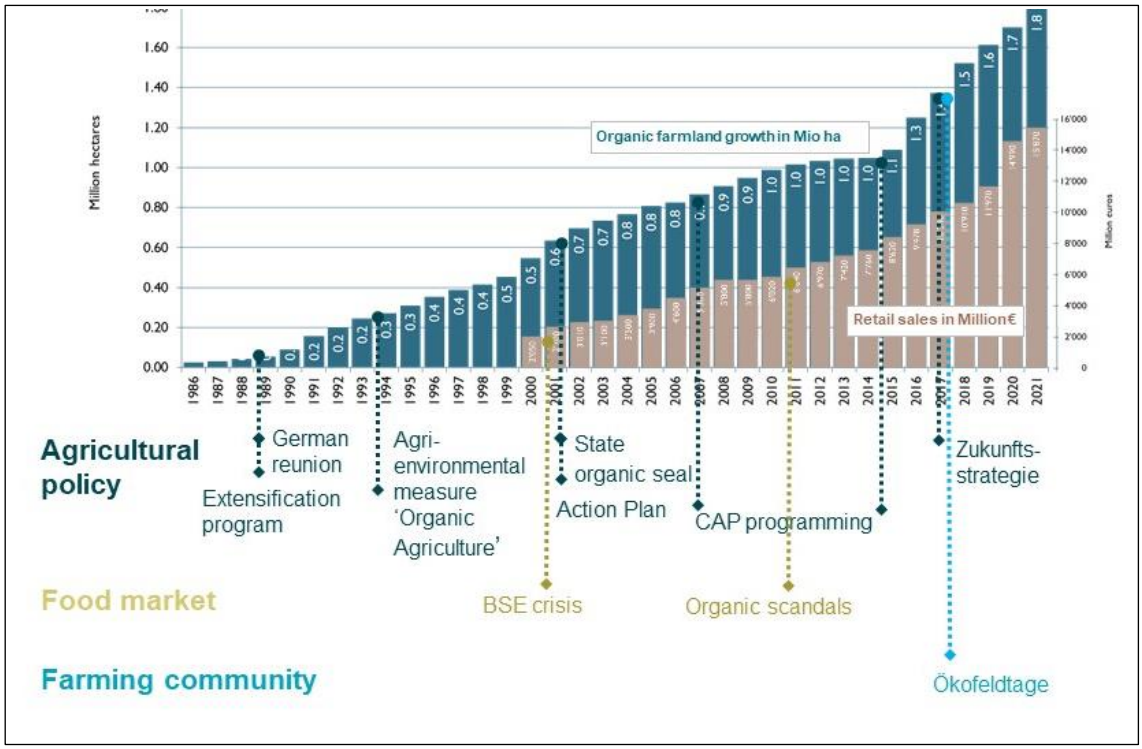

Figure 15. Key events in policy, market and farming for sector development in Germany, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al. 2023a)

Key events behind sector development in Germany

- Area-related key events

Agricultural policies are a key driving force behind area development in Germany. The notable area increase past **1989** is likely attributable to the launch of the German version of the extensification programme in 1989, which granted area support for organic farmers for the first time. This effect was accelerated by the German reunion, which led to additional area-based payments for and the expansion of organic farming in East Germany, especially on less favourable sites. Since 1994, the agri-environmental measure "organic agriculture" provided farmers with area-based payments and is seen to have notably contributed to the **growth from 2001 onwards** (until 2009) in the context of the launch of the state organic seal in 2001, the year when the BSE crisis 'helped' to promote organic as an alternative to conventional farming in the media. The German federal programme organic agriculture ("Bundesprogramm Ökologischer Landbau") was also launched in 2001 with a focus on research and information support for organic farmers, processors, consumers etc.

The support under the rural development programme as well as the GAP programming period starting in 2007 have contributed, among other things, to the moderate growth between **2007 and 2013**, while the area stagnation seen in **2014** may be linked to the insecurity preceding the next CAP programming period. With the continued support under the CAP after 2015 overall growth

increased again until **2021**, sometimes exceptionally. The renewed German organic action plan (Zukunftsstrategie) also falls into this period in which demand continued to grow considerably.

Rewe's cooperation with Naturland since **2009** marks an early case of cooperation between an organic producer association with a 'conventional' supermarket chain. Several more discounters followed (e.g. PLUS with the BioBio brand in 2015, Bioland & Lidl in 2019). In **2015** Alnatura, the second-biggest organic supermarket chain in Germany, launched the **Alnatura Bio-Bauern-Initiative** (ABBI) to promote organic in Germany, and 2017, Ammerland (Lower Saxony dairy farmer organisation) explored large-scale marketing options for milk producers from the state. It is to be seen whether and how such initiatives can help overcome the genuine limitations for organic marketing, which leaves the high profits with conventional agricultural production and sales. The least, the initiatives together with promotional events like the biannual **Organic Field Days ("Ökofeldtage")** that attract a wide range of farmers, not only organic, since 2016, are seen as contributing to the general acceptance of organic farming in the overall farming community. By contrast public and media attention for certain scandals in organic or conventional agriculture, e.g. in relation to dioxine or the living conditions of laying hens, seem to have no or only limited effects on sector development in Germany.

- Retail sales-related key events

Increases in sales in the early 2000s may be attributed to the BSE crisis and the German 'action plan', which included the introduction of one common logo and many consumer-oriented promotional activities. The engagement of several supermarket or discounter chains in developing and expanding own organic assortments together with the expansion of the Alnatura organic supermarket chain across Germany, may have contributed to the retail sales growth seen in the 2010s. In terms of retail sales development and as seen in many EU countries the COVID-19pandemic triggered a strong market growth in 2020, leading into a year of consolidation in 2021, when the market returned to a pre-pandemic growth level (or slightly above that of 2019). However, in 2022, retail sales dropped slightly post-COVID and due to rising inflation resulting from the Russian invasion of the Ukraine and related energy crisis. The increased price sensitivity of consumers for food led to a stagnation of the organic market seen only once before in Germany: in 2009, the year after the financial crisis of 2008.

Agricultural policy and support

Germany has an ambitious target of reaching 30% organic area by 2030. Policy commitment in Germany for organic are firm and long lasting, though more recently slowly shifting towards agroecological measures in conventional agriculture. The small differences between payments for organic farming and low input systems in some German states reduces the motivation to convert. While supply-push strategies were the dominant policy approach for many years, more recently demand-pull strategies gain track, e.g. public procurement. However, barriers persist in the overall organic market development, among other things because of persisting political opposition against organic farming systems in the country. With the red-green coalition of the Social Democrats and Greens Party (1998 to 2005), organic producers and non-governmental organisations (NGOs) became more involved and influential in policy making. Nonetheless, the agro-industrial lobby could broadly defend its exclusive access to national and EU agricultural policy-making (Heyen & Wolff, 2019).

Table 23. Key aspects of previous and currently planned Organic Action Plans, Germany

<table>
<tr><th>Organic Action Plans</th><th>Period</th><th>Area target UAA (in year)</th><th>Market targets</th><th>Key focus of area support</th></tr>
<tr><td>Current OAP</td><td>2023/4-2030</td><td>30% (2030)</td><td>n.a.</td><td>Higher remuneration for public goods</td></tr>
<tr><td>Previous OAP</td><td>2018-2021</td><td>20% (2030)</td><td>n.a.</td><td>Sufficient support for organic, incl. part-conversion</td></tr>
<tr><td>Number of prior OAPs (year 1st OAP)</td><td>Retail market share (2021)</td><td>Organic area UAA in 2021</td><td colspan="2">Main changes vs. previous OAP</td></tr>
<tr><td>1 (2001)</td><td>7.0%</td><td>10.8%</td><td colspan="2" rowspan="2">Markets: <u>Group action</u>: Improve supply chains (incl. input market); support small, medium enterprises /regional initiatives, <u>Procurement</u>: Availability public canteens; <u>Gastronomy</u>: Share out-of-home catering; advice <u>Certification:</u> Reduce bureaucracy, federal certificate for out-of-home catering</td></tr>
<tr><td colspan="3">Main new subjects / goals in OAP</td></tr>
<tr><td colspan="2"><u>Investment aid:</u> Support for processing</td><td><u>Export/trade:</u> Organic for food security Global South</td><td colspan="2" rowspan="2">Information: <u>Consumer</u>: Campaigning; <u>Advice:</u> Regional conversion concepts; Improve transfer; <u>Training</u>: for whole supply chain; academic/professional education, <u>R&I</u>: Food system knowledge & transfer; emphasis government institutes; regional R&I capacities; applied research systems transformation</td></tr>
<tr><td colspan="2"><u>Market data:</u> Increased data availability</td><td><u>Labels:</u> Subject area missing in both OAPs</td></tr>
</table>

Source: Lampkin et al., 2024.

The federal Programme for R&D in organic farming launched in 2001 (Bundesprogramm Ökologischer Landbau, BÖL(N)) may not seem like an Organic Action Plan in a strict sense with an emphasis on applied research and knowledge exchange and varying orientation (e.g. whether or not other forms of alternative agriculture are included) and funding levels. However, it builds the crystallisation point for a more comprehensive Future Strategy for Organic Agriculture (ZÖL), first developed in 2017 and the recently published Bio-Strategy 2030 (2023).Table 23 gives an idea of what new aspects or changes the current OAP brings forward in comparison to the prior OAP which signal an increasing level of policy ambition. The extension of focus across the whole supply chain and beyond just production related action points in both the market and information/AKIS dimension is notable.

Table 24. Comparison of planned (from 2023) and previous (2019) maintenance payments, Germany

Reference	GAP Pillar	Grass-land	Arable	Vegetables, herbs
2023 (€/ha)	2	190-284	220-314	375-680
2019 (€/ha)	2	189-273	189-273	300-550
2023/2019	-	~100%	~115%	~125%

	Protected crop-ping	Orchards, fruits, hops	Vine	Olives
2023 (€/ha)	375-4210[20]	850-1060	850+	**n.a.**
2019 (€/ha)	300-3800	665-975	675-2855	**n.a.**
2023/2019	~125%, 111%	~110-125%	~125%	**n.a.**

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

Germany has a considerably long history of organic farming. Depending on the region, the German institutional and market network can be described as strong and supportive for conventional farmers willing to convert to organic farming (Schmidtner et al., 2015), given that trusted leading figures and peer-networks exist (Padel, 2001). Overall, organic farming associations are much more unified and less conflicting as in other countries and they also collaborate well and in structured ways with other actors, like public extension service providers, research or ministries. However, funding is not always secured, and insufficient to meet growing needs (Sanders & Lampkin, 2021). Still, the sector is characterised by a high level of fragmentation with 19 different control bodies in place for certification, some only in some Länder, and numerous different organic associations competing for membership and services. Under the impression of protracted crises in agricultural markets recent discursive shifts are notable within the community away from ideas of *modernisation of agriculture*, which have shaped and supported mainly conventional agriculture in Germany for decades. Even in mainstream farming, organic is now an accepted form of production that can be profitable for farmers.

AKIS for organic agriculture

With a long tradition in organic farming, the provisions for organic in AKIS are also well established. The AKIS system in Germany integrates a wide range of actors including regional (Bundesland) and federal public administrations, private industries, agricultural organisations and NGOs. Still, the mostly state-driven AKIS in Germany appears too fragmented and lacks national coordination as to effectively establish close ties between research, advice or training and education for farmers or other organic operators.

[20] Broad ranges rest in regional variations, e.g. untypically high rate for protected cropping in Nordrhein-Westfalen, and for vines on steep slopes in Rheinland-Pfalz. Ratios partly corrected, accordingly.

Table 25. Support structures of the knowledge and innovation system in Germany

Key policy frameworks in support of AKIS		
• Responsibility for AKIS generally with 16 German regions ("Länder") • Federal: R&D programme on organic farming ('Bundesprogramm Ökologischer Landbau', BÖL) since 2001 with varying funding; CAP Strategic Plan; CAP EIP-AGRI since 2014 (covers 16% organic); Future Strategy for Organic Agriculture (ZÖL), first developed in 2017		
Research and innovation	**Education and training**	**Extension and advice**
• Regional research: universities /research stations • Federal BÖL /EIP-AGRI programmes practice-oriented, research-practice transfer. • Multi-stakeholder network on animal welfare & soon organic farming • Easily accessible information hubs for farmers /stakeholders	• Regional dual vocational education (Berufsschulen) • Advanced 1-2-year courses at technical colleges • Scattered technical colleges on organic agriculture • Targeted university programmes/ modules on organic farming • Public /private training courses on organic / specific topics.	• Regional variety in public-private systems: public / governmental, Agricultural Chambers, advisory rings; private providers. • Organic advisory use general structures; complemented by organic farmers organisations • Good national availability • Focus on technical issues.
Pertaining bottlenecks and (future) challenges		
• Gaps in R&I funding to meet organic knowledge needs • Connections to advisory services could be improved	• Ties to research and advisory • Vocational training on organic agriculture not well developed	• Structural deficit in accessibility in the East • Linkages to R&I • Insufficient funding in line with growth targets

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in Germany

The political environment in Germany was supportive for organic sector development over the last two decades, both at Federal level and in most Länder. Regarding market development, specialised organic food stores as established system for food purchases are more recently loosing market relevance compared to supermarkets (including those specialised on organic) and pharmacy chains (Darnhofer et al., 2019; Jahrl et al., 2016; Łuczka & Kalinowski, 2020), which adds to the recent market and area development. Still, there are numerous factors hindering sector development: On the one hand, the high level of fragmentation in the sector with multiple control bodies and associations results in patchy services and adds to quite substantial variances in policy and extension service practices between different organisations and Länder. On the other hand, recent political lobbying against organic farming in combination with agroecological measures gaining ground as alternative for conventional agriculture undermine the political standing of organic despite the internal unity of organic farming associations. Whilst the German AKIS is considered one of the strongest in Europe, there are problems with fragmentation and knowledge exchange between regions and actors. Although the research landscape for organic

farming in Germany is rich, research and educational organisations are not always sufficiently cooperating.

Italy

In Italy, 2.2 million hectares or 16.7% of the total farmland were organic in 2021. While Italy is the country with the highest number of organic producers, organic retail sales are not only in absolute terms rather small, but also in terms of market share (3.4% of total supermarkets sales, excluding variable-weight product sales, e-commerce, direct sales and specialised shops[21]) (FiBL, 2023). The sector grew significantly, but unevenly in the last decades. While area growth and CAGR in were above EU average in the 1985-2000, it was considerably lower than in the EU.

Table 26. Key indicators organic sector development Italy, 1985-2021

Italy *Key indicators*	Farming area in ha			Growth of area		Compound annual growth rate CAGR	
Organic production growth	**1985**: 5,000	**2001**: 1,237,640	**2021**: 2,186,159	**1985-2000**: +20,708%	**2001-2021**: +77%	**1985-2000**: 42.7 %	**2001-2021:** 2.9%
	Share of farmland (%)			*EU average (in %)*			
	0.03%	9.5%	16.7%	*(+3,863%)*	*(+263.1 %)*	*(27.8%)*	*(6.7%)*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001	**2021**		**2001**	**2021**	**1985/2001**	**2021**
	115	579		4,231	23,802	600/56,199	75,874
	Imports			**Retail sales million €**		**Retail sales growth (%)**	
	2001	**2021** (metric tons)		**2001**	**2021**	to **2021**: +247%	CAGR to **2021**: 6.4%
	No data	224,956		1,050	3,943 *(3.4% of all sales)*	*EU average: +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al. 2023a)

The country experienced a longer period of stagnation or decrease in the first decade of the century, when also the CAGR for retail sales was below that of the EU (see Table 26. Key indicators organic sector development Italy, 1985-2021Table 26). However, it doubled its organic UAA during the 2011-2021 period and has increased organic farmland in 2022 up to 2.3 million ha or 18.7% of the total farmland (SINAB, 2023). In 2022, the number of producers has also risen to 82,603 organic farms, which are on average bigger in size than conventional farms and represent 7.5% of total farms, accordingly.

[21] Note: the indicator 'retail sales' excludes fresh products sold unpacked (variable weight), directly, online or through box schemes as well as specialised retailers which for Italy would mean around 2'000 million euros more market value in 2022-2023 (Source: Nomisma, 2023). The same applies to all countries, though.

Agricultural production structure and market dynamics

The two main land use types in organic agriculture are permanent grasslands (57.7%) and arable land (40.5%) (EUROSTAT, 2023b). The geographical distribution shows that 51% of the organically cultivated land are in four regions: Sicily, Puglia, Calabria and Emilia-Romagna (SINAB, 2020). By 2020, the expansion of organic market reached a 1,712 million euro revenue, represented mainly by packaged food and beverages (Global Organic Trade Guide, 2023). Oriented at and dependent upon producing for export – Italy has the most significant export value in the EU – the total share of organic food sales in Italian food expenditure was comparatively low with 4% (SINAB, 2020). As in most countries, distribution in internal markets is mostly organized through supermarkets and general store chains. Specialised organic stores / chains (e.g. Naturasì) represent about 25% of total sales; and so do the other channels (e.g. pharmacies, independent food stores, box schemes, direct sales, ecommerce). Short food supply chains to stimulate the diversification of organic farming have evolved especially around densely populated areas of Italy (Rover et al., 2020).

The recent development of online sales (internet /WhatsApp orders, etc.) in the context of the pandemic has stimulated the growth of box schemes, both at the national and the local level, with an increase of door-to-door delivery. Although Italian consumers are highly aware of the EU organic logo (Zander et al., 2015), per capita purchases are limited, because organic products are higher in price and unevenly accessible across various regions. The lack of specialised supply chains in many regions impacts on consumer prices and domestic consumption, respectively. Still, other quality-related labels, like traditional specialities or geographical indication, as well as local farmers markets (strongly supported by the powerful farmers' union Coldiretti) are well established and compete with organic labels in a way described as a hampering domestic market development, although less for exports. Communication difficulties along the supply chain undermined the development of a domestic organic food market (Nicholas et al. 2007).

Key events behind sector development in Italy

Italy enjoyed a period of notable area growth up to 2001, followed by a period of stagnation with ups and downs until 2013. After that, a period of renewed growth, sometimes exceptional, lasted until at least 2021.

- Area-related key events

To understand the considerable growth until 2001 Italy's role as the country with the most significant export value in the EU is key. The sector has equally benefitted from the launch of the EU single market in 1993. Already since 1988, Italy presents its organic products to (inter)national buyers on SANA fair. Domestically, organic products were introduced in major supermarkets from 1992 onwards.

The stagnation and ups and downs between 2001 and 2021 are linked to a combination of different factors (Gambelli & Vitulano, 2007; Arzeni et al., 2021). Firstly, the relative height of the support payments under the rural development programmes and CAP during this period play a critical role disincentivizing further conversion. Hardly any difference existed between organic and general low input practices with less demanding requirements and controls. Secondly, the funding commitment under the RDPs (Regulation 2078/92) for maintenance favoured existing organic

farms over new entrants with disproportionally lower conversion support (see also Table 43). This effect concerned mainly regions with highest growth until 2000.

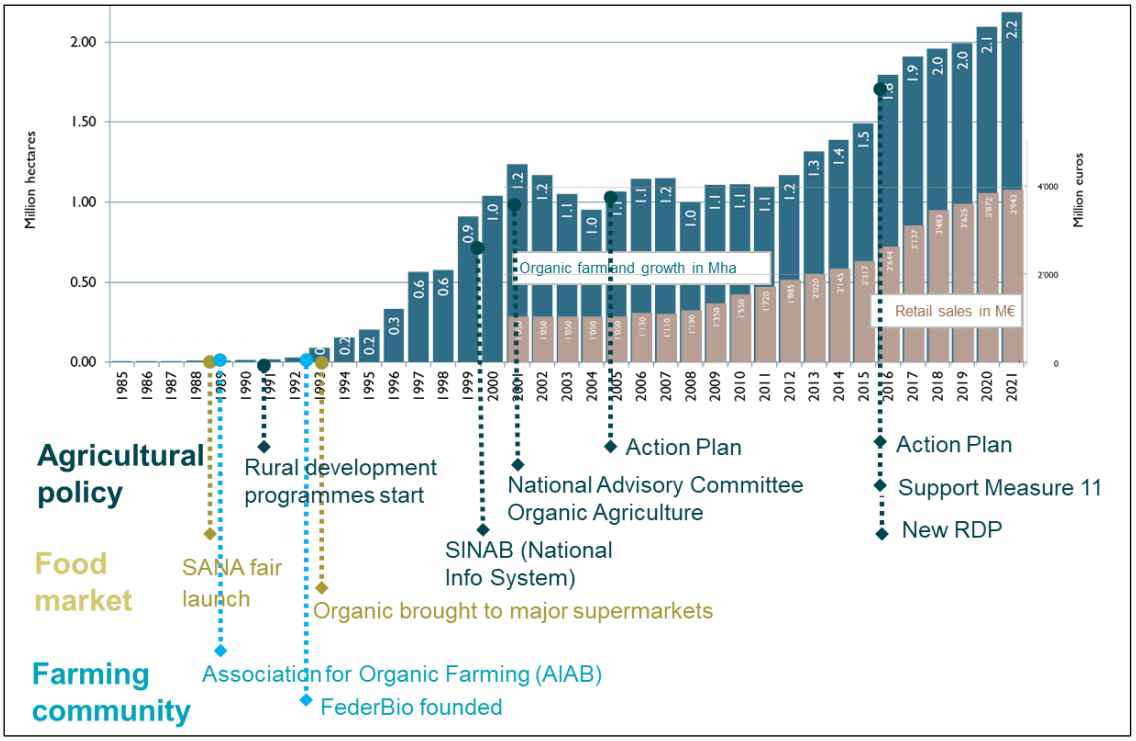

Figure 16. Key events in policy, market and farming for sector development in Italy, 1985-2021[22]

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees at el. 2023a)

The organic area grew again since 2012 at a low CAGR, leaping in 2016, the year when almost all regions published their calls for commitment to the new agricultural support Measure 11, which institutionalised organic farming support as a means to increase environmental sustainability in agriculture. The new organic support measure coincides with the adoption of new regional RDPs with higher incentives for organic farming, e.g. supporting farm investments, supply-chain capacity building, or advisory and research.

- Retail sales-related key events

In the same period, the organic domestic consumer demand increases, given the expansion of specialised organic retail chains, and higher availability of organic products and organic assortments in ordinary supermarkets.[23] Playing into this development are the organic action plans launched, that among others introduced and support organic food in schools, contributing to awareness of organic food across Italy.

[22] Market data between 2001-2009 not provided for each year and not yet consolidated.

[23] Regarding retail sales it needs to be considered that time-series data collection started in 2000, and was mostly limited to scanner data from supermarkets and general stores, while organic specialised retail data, quite relevant in Italy specially in the earlier years, are based on estimates (and omitted from this analysis).

Agricultural policy and support

State relations are described as generally supportive, with certain supporting measures in line (e.g. subsidies), but overall passive. While Italy has already four action plans in place, the level of ambition has only slowly increased. The 2007 action plan, for instance, was formulated in general terms and not officially approved (Nicholas et al., 2007). The first national plan for organic agriculture and organic produce was developed by the Ministry of Agriculture and Forest Policies (MIPAAF) in 2005. In 2008, a national programme for the development of organic agriculture and produce was launched.

Latest with Measure F, that took effect in 2000, support for conversion or maintenance is continuously provided for major agricultural activities. However, payment rates have increased mostly only after 2013, but not consistently for all types of production (e.g. forages, pastures/grassland, olives, see Table 43 and Table 44 in the Annex).

While policies on organic agriculture seem generally supportive (e.g. subsidies), they are also perceived – depending on the region – as too passive as to help consolidate both production and especially demand. Playing into this is the increased perceived resistance and **lobbying against organic farming** of different actor groups in policy, farming and science. Public procurement (e.g. school food) programmes have gained importance in Italy as key demand-pull strategy (Darnhofer et al., 2019; Morgan & Sonnino, 2013). Generally, large differences exist in mode and scope of policy support between different federal states, which impedes the development of organic farming in Italy. At least in the past, the highly bureaucratic payment system added to the list of barriers (Nicholas et al., 2007).

Table 27. Key aspects of previous and currently planned Organic Action Plans, Italy

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2023/4-2030	25% (2027)	n.a.	Conversion support; eco-schemes; organic seed production strategy
Previous OAP	2016-2020	16% (2020)	4.5%	RDP, regional consistency; explore system approaches; audit & sanctioning options
Number of prior OAPs (year 1st OAP)	**Retail market share** (2021)	**Organic area** UAA in 2021	**Main changes vs. previous OAP**	
2 (2005)	3.4%	16.7%	Market target: **Subject area missing in new OAP**	Trade/Export: **Subject area missing in new OAP**
Main new subjects / goals in OAP				
Production: Investment aid: increased support (from 50% to 60%) in fruit sector				
Markets: *Group action: RDP for producer groups; further develop Bio-districts (agri-environment measures, ministerial decree, best practice); strengthen supply chains; local marketing; inter-business network contracts,* Procurement*: organic in public procurement; regional support for school canteens;* Gastronomy*: organic in hospitality catering* Logo*: National logo (Biologico Italiano); studies; technical implementation capacity; define procedures /eligibility;* Certification*: group certification, esp. Bio-districts; consumer trust in control systems; database to monitor product flows; revise regulations; improved import controls*			**Information:** Consumer*: Nutrition/ food education & campaigning; evaluation; national organic event; competitions; national info system;* Advice*: focus livestock & aquaculture; more AKIS beneficiaries (RDP); SINAB internet platform; support advisory services;* Training*: Roundtable professional training; multi-annual training plans (advisers, trainers, inspectors etc.),* R&I *research & info on production, processing & marketing; R&I & exchange for sustainability; national R&I plan; agronomic & agroecological research; (animal) nutrition, plant protection, breeding; viability livestock; markets & consumer;* Statistics*: improve data for market transparency; research projects incl. SINAB; enhance EU-SAIO-Regulation; regular sector & trend reports; better document certified & supported areas*	

Source: Lampkin et al., 2024.

Table 28. Comparison of planned (from 2023) and previous (2019) maintenance payments, Italy[24]

Reference	GAP Pillar	Grass-land	Arable	Vegetables, herbs
2023 (€/ha)	2	15-450	53-600e	173g-1000
2019 (€/ha)	2	12-450	90-600e	270g-1000
2023/2019	-	~100%	~100%	~100%
	Protected crop-ping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	950	220-1068	540-1190	310-810
2019 (€/ha)	480-1200	102-900	450-900	330-810
2023/2019	~80%	~120%	~125%	~100%

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

Italy has a long-standing tradition in organic farming with a diverse, but sometimes conflicting community of organic farming associations. The "Alce Nero" cooperative, founded already in 1971, became Italy's first organic cooperative in 1978; the association "Suolo e Salute" (since 1969) became a control body. The relations between organic farming institutions and the State in Italy are in principle supportive but passive (Darnhofer et al., 2019; Daugbjerg & Schvartzman, 2022). By contrast, considerable support comes from civil society actors, especially around the Slow Food movement. Still, the prevailing discourse highlighting 'local production' is not supportive but rather competing with 'organic' for 'conscious' consumers. Based on a shared commitment to traditional family farms, organic farmers associations have built alliances with established farmers unions or associations.

AKIS for organic agriculture

The AKIS for the organic sector in Italy can be described as a thematic sub-system of the main AKIS. AKIS actors engage in organic agriculture through research, innovation, education, training and consultancy according to a regionally fragmented setting, and relying on local, regional and national actors with their local branches. The work carried out by national and local networks only partially compensates for the lack of public support (financial and human), with high differences in quality between regions and production sectors. Considering the multi-faceted and integrated nature of organic agriculture, Italy's AKIS for organic is too fragmented and unstructured as to ensure effective knowledge exchange among AKIS actors across regions and sectors.

[24] Broad range rests in regional variation, different livestock types and management intensity or reflects lower values for medicinal and aromatic herbs or nuts.

Table 29. Support structures of the knowledge and innovation system in Italy

Key policy frameworks in support of AKIS		
• Italian National Action Plan for Organic Farming and Products (2005, renewed in 2008); 2014-2020 CAP framework and Strategic Plan • Focus areas: training programmes, consultancy interventions, interregional cooperation in research and consulting; new coordination bodies; administrative review; improved data collection, monitoring; risk management.		
Research and innovation	**Education and training**	**Extension and advice**
• Practical, co-constructive research with well-functioning research transfer • Improved exchange research-advisory (through EIP-AGRI, PIF (Integrated Supply Chain Projects), or RDPs). • Several specialized exchange platforms	• Few undergraduate /post-graduate courses & training programmes • Some university courses on sustainable agriculture incl. organic practices /principles • Few collaborative training initiatives for farmers, processors, advisors e.g. 'Academia Bio' by Federbio	• Specific assistance to (small-scale) organic farmers through few competent /dedicated private actors • Public support services work where regional funds and political support exist
Pertaining bottlenecks and (future) challenges		
• Practice orientation not always structured • Exchange platforms with limited scope; absence of a national e-infrastructure • Lack of continuity of efforts and shared vision for future of sector undermines effective R&I collaboration	• Continuous / structured public education or training on organic broadly missing • Sporadic training programmes lack innovation to attract attention for organic farming. • Non-permanence in courses	• Fragmentation of system: lack of dialogue (e.g. research-transfer) & common systemic thinking. • Too few advisory bodies with broad & comprehensive scope (incl. sales /marketing) • Lack of inter-regional collaboration.

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in Italy

Italy has a considerable share of organic in its farming area that is linked to its role as a top-exporter for organically produced high quality food. Although organic and established farmer associations share a commitment to family farming, key limitations persist to growth of the domestic market. While limited resources and coordination across the AKIS hamper innovation and capacity building in the sector more generally, market actors have broadly failed to coordinate and communicate in sufficient ways in support of domestic market development and in raising consumer interest and awareness. This may be partly grounded in the heterogeneity of and conflicts in the farming community. However, and despite existing demand side-oriented policies through public procurement (e.g. school canteens) or consumer organisations' support (Slow Food movement), the political environment in Italy seems also too passive to overcome the structural problems behind the insufficient regional and cross-sectoral coordination. The regional differences regarding the importance of organic farming are considerable and reflected in different degrees of political and technical support by regional governments.

3.4.3. Below average: Hungary and Romania

In our study, Romania and Hungary serve as focus countries representing a key group of countries that share a rather young history as EU Member States, while having undergone partly dramatic political and economic transitions especially in the '90s. Although growth of organic production and retails is rather low in absolute and general terms, it is still fairly remarkable in relative terms. Growth is tied to the access to EU markets and agricultural subsidies. However, different prerequisites for organic sector development in both countries make them an interesting 'group' to gain insights into what drives sector development in initial phases and emerging markets.

Hungary

In 2021, almost 300,000 hectares, or 5.9% of the organic farmland, were organic (FiBL, 2023)[25]. The growth since 2001 was above EU levels. Since 2016, organic area growth has been particularly strong, flattening after 2019, regaining track in 2022. Although organic area was below EU average in 2022 (6.41% or 325,729 ha), the recent growth is considerable.

[25] Data about organic acreage and number of operators for Hungary is available from 1988 onwards (for EU since 1985). As in the case of Romania, retail sales data are not available for Hungary; there is only an estimate since 2015

Table 30. Key indicators organic sector development Hungary, 1985-2021

Hungary *Key indicators*	**Farming area in ha**			**Growth of area**		**Compound annual growth rate CAGR**	
Organic production growth	**1985** *no data*	**2001** 79,178	**2021**: 293,597	1988-2000 +4,622%	**2001-2021** +271%	1988-2000 37.9 %	**2001-2021** *6.8%*
	Share of farmland (%)			*EU average (in %; 1985-2000; 2001-2021)*			
	n.a.	1.7%	5.9%	*(+3,863 %)*	*(+263 %)*	*(27.8%)*	*(6.9%)*
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001		**2021**	**2001**	**2021**	**2001**	**2021**
	1		61	*67*	4,899	1,040	5,129
	Imports			Retail sales million €		Retail sales growth (%)	
	2001		**2021** (metric tons)	**2001**	2015	to **2021**: *No Data*	**CAGR**: *No Data*
	No data		1,169	*No data*	30 (estimate)	*EU average: +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees at el. 2023a)

Agricultural production structure and market dynamics

The two main land use types in organic agriculture in Hungary in 2021 are permanent grasslands (61.17%) and arable land (34.12%) (EUROSTAT, 2023b). The organic sector in Hungary is highly export-oriented, with approximately 85% of the organic production going into export. Exports are mainly raw materials or products with low added value. Export was the biggest driver for organic farming development in Hungary for a long time, but is also seen as the biggest barrier for developing a local market. Notably the majority of the organic farms in Hungary are only partially converted. They keep parallel conventional production lines because neither the organic subsidy scheme nor a regional/national label requires full conversion. In addition, conventional practices are subsidised at comparable level. Adding to this, there is limited availability of organically produced inputs (especially feed and seeds) in the country.

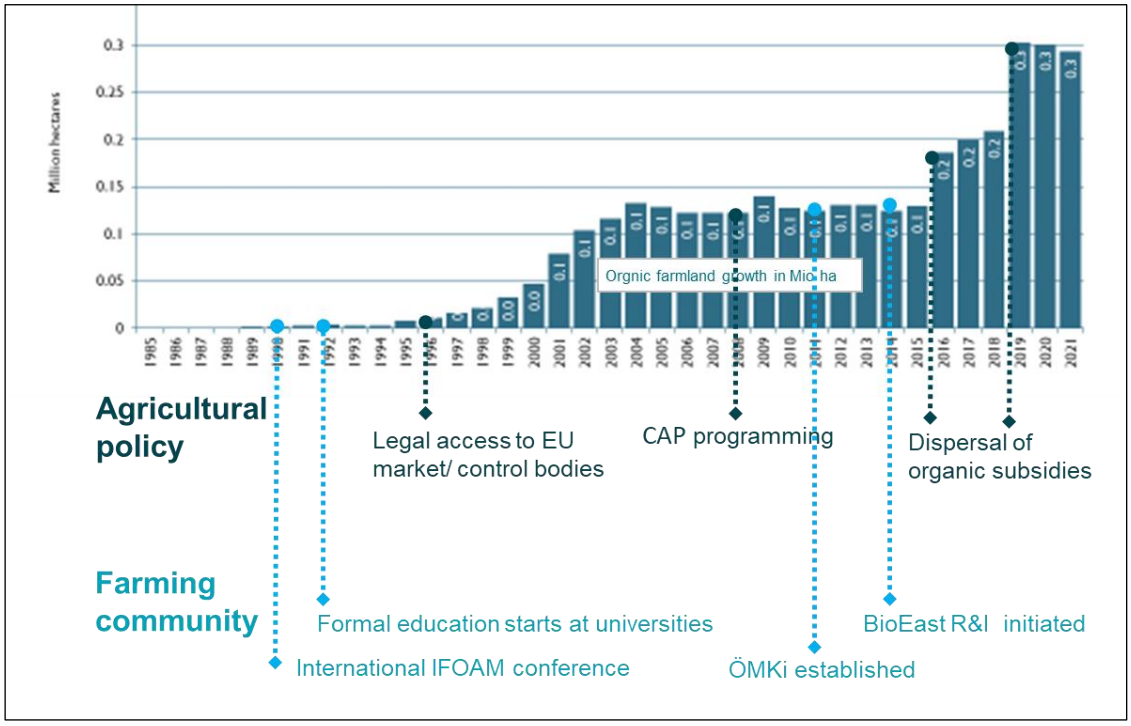

Figure 17. Key events in policy, market and farming for sector development in Hungary, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees at el. 2023a)

Key events behind sector development in Hungary

The changes in the organic sector are to be seen in the broader context of processes affecting the country's agriculture, food industry and trade in general. Until 1989, 70% of the agricultural area was farmed by socialist cooperatives and 12% by state farms. After a far-reaching restructuring of the sector took place in the course of restitution and privatisation in the 1990s, agricultural production dropped dramatically in 2009 (compared to 1989) to a gross value of only 3% (share of GDP) as farms substantially reduced their livestock (pigs and cattle) due to lacking capital. The below figure provides key events in policy, market and farming community that relate to these developments and which are further explicated below.

Already during the pre-accession harmonisation process (1999-2003), the governance of the agricultural sector was aligned with the EU Common Agricultural Policy. For the substantial increase in and after **1999,** market demand (for export mainly) was a key driver of organic sector growth in Hungary. Since 1996 the Hungarian organic control system allowed access to the EU market, providing a competitive advantage over several other big cereal producer countries like Romania, Croatia, or Ukraine. But it was only with EU membership of Hungary (**2004**) that area-based payments – including for organic farming – became available; exclusively for crop production.

Support increased significantly after **2015** and **2018** (+74% compared to 2015) with a noticeable area increase in **2016** and **2019**. Phases of stagnation or decrease (e.g. 2005-2008, 2010-2014) relate to the fact that within the 5-year CAP cycle calls are limited to the initial year and that payments are higher for conversion than maintenance. It is unattractive to convert 'in between' cycles, and there is drop-out at the end of programming periods.

Already in 1983, the Hungarian Association of Organic Farming (Biokultúra) was founded, but it was only after the regime changes in the late 1980s/early 1990s that higher interest in organic agriculture evolved, e.g. through the close ties established with IFOAM Organics Europe after **1990**. In **1992** the Kishantos farm was converted as a first organic model farm and formal education programmes on organic agriculture started at agricultural universities. Campaigning increased around the conversion of successful big professional farms (e.g. in National Parks). With the ceasing influence of the state after 1989, newly emerging private farms could explore new markets for new products with at that time unlimited marketability; a number of them being Austrian farmers that could access land in a liberalized market. Organic agriculture is a focus also in the BIOEAST initiative, a Central-Eastern European R&I initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy. The Agroecology and Sustainable Yields working group is coordinated by the Hungarian Ministry of Agriculture and ÖMKi (Hungarian Research Institute of Organic Agriculture). While the foundation of the latter in 2011 had no direct or immediate effect on area growth, its research and extension services activities contribute to overall conversion success in the organic system.

Although the internal market development was low in initial years, recent consumer surveys suggest an increased demand for organic products in Hungary.[26] The availability of organic products in discounters, supermarkets, pharmacy or online shops is growing, whereas the inflation seen in Hungary between 2022 and 2023 (>100%) has substantially decreased the price difference between conventional and organic food. Also, the recent energy and market crises in combination with frequent weather extremes (e.g. drought in 2022) make organic more attractive as less dependent on external inputs. Still, the waived customs fees and inspections for Ukrainian produce were highly disruptive for the Hungarian organic (and conventional) cereal export market.

Agricultural policy and support

The first organic action plan in Hungary was launched between 2014-2019 with the main aim of reaching 350,000 ha of organic farmland. While this target was almost achieved (300,000), other targets, regarding organic livestock-growth, availability of organic slaughtering-points, number of organic beehives, share of organic food in public catering, were not. The second organic action plan covers the period of 2022-2027, and aims at a 10% area share of organic agriculture. Other targets are the promotion of organic, research, market development, or public catering. The existing CAP strategic plan is principally well-aligned with the strategic targets of the EU. However, there are pertaining gaps in policy implementation (e.g. lacking advisory services), which need to be filled rather locally by highly committed practice partners.

[26] Pending open source market data available for organic food and beverages in Hungary, statistical publications mostly rest in expert opinion

Table 31. Key aspects of first Organic Action Plan, Hungary

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2022-2027	10% (2027)	5% by 2027	increase support for horticulture & livestock; specific support regulation
Previous OAP	2014-2021	-	-	support production & key products; integration in agri-environment measures

Number of prior OAPs	**Retail market share** (2021)	**Organic area** UAA in 2021	**New subjects / gaps vs. first OAP**	
0	0.3%	5.9%	Tourism: *Encourage organic in out-of-home catering, incl. certification*	Export: **Subject area missing in new OAP**

Main subjects in first OAP	
Production: Investment: *10% higher grants for processors; +20% supported business.* ***Target: double** certified **processors by 2027***	
Markets: *Group action: producer groups; improve supply chain input; producer-processor networks; supply chain development programme,* Procurement: *green public procurement strategy 2023+;* ***Target**: **20%** HU organic products; trainings officials;* Logos: *explore HU organic logo; bio-region;* Certification: *support alternative certification; implement organic regulation; group certification; regular sector consultations; analyse & publish non-compliance data*	**Information:** Consumer: *best organic product award; promotion campaign* Advice: *stronger advice; train advisors; national advisory system; demo-farm network; resources for farmers;* Training: *more trainings; review availability,* R&I: *strengthen R&I; task force on priorities, funding, etc; support EIP operational groups; integrate with Horizon Europe; double presence in (inter)-national working groups; 10% of PhDs/ funding for organic* Statistics: *digitalisation strategy for organic sector needs; incl. certification; collect market data; establish online database*

Source: Lampkin et al., 2024.

Moreover, continuous and incentive-based EU subsidies for agriculture have contributed to organic sector development in the country over the years. Until 2015, organic farming was broadly considered as (just) one out of several land use options and lower requirements for general agri-environmental subsidies made conversion less attractive for farmers. Although financial and human support in Hungary has increased considerably (see Table 44) and above those for conventional, mainstream agricultural interests still dominate policies and weaken the position of organic farming institutions in the policy arena.

Table 32. Comparison of planned (from 2023) and previous (2019) maintenance payments, Hungary[27]

Reference	GAP Pillar	Grass-land	Arable	Vegetables, herbs
2023 (€/ha)	2	204	349	664
2019 (€/ha)	2	147	172	516
2023/2019	-	138	203	129
	Protected cropping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	664	967/ 1136	1097	n.a.
2019 (€/ha)	516	568/ 802	674	n.a.
2023/2019	129	170/ 142	163	n.a.

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

As also indicated by a comparably high level of payments for agriculture (including organic), the level of political and financial support for the development of organic farming in Hungary is (increasingly) high. There is a small but highly dedicated community of pioneering actors that are also highly relevant for the AKIS. However, despite these efforts and resources invested to develop organic farming further in Hungary, key interest groups hold a rather weak position in the policy arena vis-à-vis dominant mainstream lobbying. This is also owed to pertaining internal conflicts within organic farming associations that weaken organic farming interests in the policy arena.

AKIS for organic agriculture

AKIS for organic in Hungary is in need for more central coordination efforts and dedicated funding. Currently, AKIS for organic rests in a network of few dedicated public and private actors. Hungarian organic production needs more practice-oriented research, more dissemination work, backed up by local scientific evidence. Cooperation and better communication between organic actors (producers, traders, umbrella organisations, certifiers and research institutions) is essential.

[27] Payments for apple orchards are higher. All land uses also get 60 €/ha for first 5 ha and may be combined with an additional 65 €/ha under the ecological cultivation measure.

Table 33. Support structures of the knowledge and innovation system in Hungary

Key policy frameworks in support of AKIS		
• Organic Action Plan (2014-2020), renewed National Action Plan for Development of Organic Farming (2022): advisory services /specialized network by Chamber of Agriculture (2024+), technical guidelines for conversion • Task force (2023) by Ministry of Agriculture: improve organic R&I, coordinate research • Project grants (e.g.: National Rural Network, EIP Agri Operational Groups)		
Research and innovation	**Education and training**	**Extension and advice**
• ÖMKi leads co-creative organic research & knowledge exchange (living Labs on-farm experiments) • Dedicated researchers at universities/public research & innovative organic farmers • Local/ international projects • Site trials to measure effectiveness.	• Free/low cost trainings at different education levels • No 'formal' qualification for converting farmers • 1 MSc programme (MATE Uni) • Shorter courses on organic topics outside formal education (research projects).	• Administrative assistance on subsidy application • Technical/production assistance via international input providers / traders • Certification bodies as source on compliance requirements • Few international organic advisors for large scale operations, fee-based.
Pertaining bottlenecks and (future) challenges		
• Lacks systematic approach • Based mainly on short term projects and dedicated research organisations/actors	• No BSc-level programme • Organic farming underrepresented in sustainability-related course portfolio	• Few administrative staff specialised in organic farming • Few independent service providers

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in Hungary

The opportunities offered with EU membership (subsidies and market access) form the basis of organic sector development in Hungary. However, several key barriers persist that hindered the country to make full use of its organic potential: i) the high export orientation of organic production (raw materials), ii) the comparatively high political and financial support for conventional agriculture – in light of iii) high certification costs and relatively low farming income – while iv) consumer awareness and the v) demand side especially inside the country (including for inputs) remain underdeveloped. Additionally, there is vi) lacking coordination and cooperation among key organic (AKIS) actors, and a lacking culture of cooperation in general. Farmer specific issues related to aging (of farmers), and lack of agricultural education add to the list. Despite Biokultúra's long existence, advocacy of organic farmers is principally rather weak in Hungary, because bottom-up organization and self-representation of organic farmers are largely missing. Interests of (a few powerful) certification bodies predominate.

Romania

In Romania, the organic farmland area has shown substantial growth since area data were available, starting in 1995. While during 2014-2017 notable decreases were noted, the time from 2017 onwards is characterised by annual growth rates of well over 20%. For the country no retail sales data are available.

Table 34. Key indicators organic sector development Romania, 1985-2021

Romania *Key indicators*	Farming area in ha			Growth of area		Compound annual growth rate CAGR	
Organic production growth	**1985** *no data*	**2001** 28,700	**2021** 578,718	**1985-2000** +1,674%	**2001-2021** 1,916%	**1995→2000** 77.7 %	**2001→2021** *16.2%*
	Share of farmland (%)			*EU average (in %)*			
	n.a.	(0.2%)	(4.3%)	(+3,863 %)	(+263 %)	(27.8%)	(6.7%)
Growth of organic market	**Importers [No]**			**Processors [No]**		**Producers [No]**	
	2001	**2021**		**2001**	**2021**	**2001**	**2021**
	No data	34		*No data*	209	No data	11,562
	Imports			**Retail sales million €**		**Retail sales growth (%)**	
		2021 (metric tons)		**2001**	**2021**	to **2021**: *No Data*	CAGR: *No Data*
		9,939		*No data*	*No Data*	*EU average +636.1%*	*EU average 10.5%*

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

Agricultural production structure and market dynamics

The two main land use types in organic agriculture are arable land (59.24%) and permanent grasslands (37.09%) (EUROSTAT, 2023b). The main arable crop groups are cereals, green fodder and oilseeds. The main permanent crops are fruits, grapes and berries (Organic Europe, 2023). Land fragmentation and a rising number of small farms in Romania together with a historically low level of chemical use in agriculture make the country a generally highly suitable place for organic farming. Generally, the organic sector in Romania is highly export-oriented (towards Western-Europe and Middle-East (Organic Europe, 2023), which has spurred organic sector development. At the same time, export of mainly raw materials undermines domestic market development.

Key events behind sector development in Romania

EU membership of Romania (2006) is broadly portrayed as the key political event to have spurred the development of organic farming in the export-oriented country. No direct explanation exists for the notable drop between 2014 and 2016.

Several agricultural policy measures that are linked to EU membership have probably contributed to the growth. While the rural development programmes of the EU (since January 2007, when Romania became an EU member) had a considerable impact, there have also been some notable

preparatory measures for the accession, which include 'Ordinance 34' (first national market regulation aligned with the EU organic regulations). In 2005 Romania's organic system was accepted as equivalent to the EU system by the EU Commission, which eased market access for organic products from Romania. Nonetheless, a significant number of farmers that benefitted from the CAP programming after 2009/10 are said to have re-converted after five mandatory years, which may explain the drop of certified land after 2014.

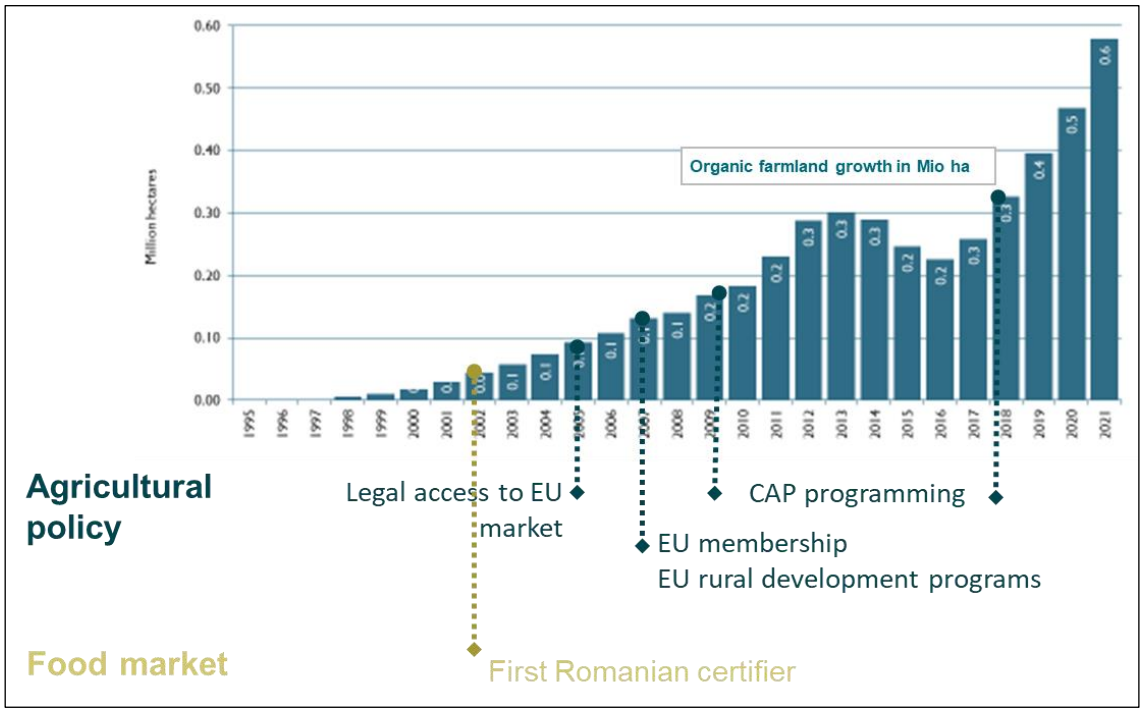

Figure 18. Key events in policy, market and farming for sector development in Romania, 1985-2021

Sources: Eurostat / national data sources. Compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

While there is no time series data on the internal market, Romania has played an essential role as a supplier of organic products for other countries. Foreign certifiers operate in Romania since 1990, which has initiated growth of the organic area since the last decade of the 20th century. The first Romanian certification body entered the market in 2002. The current trend of reduced demand for organic products across the EU marks a notable risk for maintenance especially for cereal farmers in Romania.

Agricultural policy and support

Although the first action plan on organic farming for Romania was only released in 2023 (see Table 35 for details), supportive legislation for organic sector development is in place since the early 2000s when it evolved in preparation of EU membership. Within the EU legislative frameworks for the new EU Member State to be, the first set of standards along with the first subsidy system were installed in the mid-2000s (Organic Europe, 2023). Nonetheless, there is a lack of confidence in supportive government policies of organic farming, not least because of the mainstream dominance in the sector.

Table 35. Key aspects of first Organic Action Plan, Romania[28]

Organic Action Plans	**Period**	**Area target UAA (in year)**	**Market targets**	**Key focus of area support**
Current OAP	2023-2030	6% (2030)	n.a.	More income for small farms; similar per ha payments; environmentally-certified social/care farms
Number of prior OAPs	**Retail market share** (2021)	**Organic area** UAA in 2021	**Main gaps in first OAP**	
n.a.	0.15%	4.3%	*Market share target*	
Main subjects in first OAP				
Production: Investment aid: *support for marketing & processing;* Group Actions: *expand/diversify sector; producer organisations; innovative supply chains;* Procurement: *Procurement; more organic in public canteens; staff training; simplify certification procedures; pilot projects;*			**Markets:** Tourism: *Pilot projects; organic routes/ centres,* Export: *work with embassies; export councils; trade fairs; visibility through export enterprise clusters -,* Logo: *protect labels & terms,* Certification: *improve consumer trust (effective controls); industry-regulator cooperation; fraud detection; effective regulatory framework; laboratory testing for imports*	
Information: Consumer Information: *on EU law/logo; public debates /festivals; thematic events; study consumer benefits; organic districts; national organic day; nutritional education; info young consumers; farm visits;* Advice: *Advisory centres; access advice / demonstrations; network of demo-farms; farmer best practice exchange; RDP AKIS measures; research transfer;* Training: *modules /programmes in agric. schools & universities; workplace on farms; trainings for farmers, processors etc.; regional training centres;* R&I: *resource efficiency (packaging & waste); research dissemination; producer-relevant research (env. friendly methods, plant & animal breeding); EIP operational groups; joint project funding (producers & organisations); Horizon Europe engagement;* Statistics: *market studies; data on production & processing; suitable databases, websites & search engines; annual consumer survey*				

Source: Lampkin et al., 2024.

At least in the past years, the political strategy in Romania seemed to mainly follow short-term interests in receiving EU funding, which is considerable for the low-income country (see Table 36).

[28] Romania has no previous national organic action plan to compare with. First experience with Action Plans exists only as part of an SME project in the North-Western part of the country

Table 36. Comparison of planned (from 2023) and previous (2019) maintenance payments, Romania[29]

Reference	GAP Pillar	Grassland	Arable	Vegetables, herbs
2023 (€/ha)	2	73/ 129	218	350/ 431
2019 (€/ha)	2	73/ 129	218	350/ 431
2023/2019	-	100	100	100
	Protected cropping	**Orchards, fruits, hops**	**Vine**	**Olives**
2023 (€/ha)	431	442	479	n.a.
2019 (€/ha)	431	442	479	n.a.
2023/2019	100	100	100	n.a.

Source: Lampkin et al., 2024.

Institutional setting and sectoral cooperation

On the policy level, (human) resources were and are dedicated to the development of organic farming in Romania, but organic farming is still confronted with mainstream lobbying dominance weakening the position of organic farming institutions in the policy arena. Mistrust characterizes the relationships among key actors. Internal conflicts within the organic farming hamper the representation of organic farming interests in the policy arena. This void is filled by highly dedicated individuals of the organic farming community.

AKIS for organic agriculture

The strength of the Romanian AKIS for organic agriculture lies in regional cooperation and commitment from various actors. Current developments aim at strengthening the position of organic actors within the system. Challenges persist, however, in terms of fragmentation, funding, coordination, and specialisation.

[29] Payments for grassland with agri-environmental commitment and medicinal and aromatic herbs are lower (first numbers).

Table 37. Support structures of the knowledge and innovation system in Romania

Key policy frameworks in support of AKIS		
• New CAP Strategic Plan: strengthen position of organic actors in the AKIS • Lacking details on national priorities/ implementation.		
Research and innovation	**Education and training**	**Extension and advice**
• Demand-driven agricultural research (increasingly participatory) • Clusters key for networking & cooperation • Local e-infrastructures for clusters, business, export, technology transfer and R&D • National R&D programmes with complementary funding.	• Few public education programmes, vocational trainings on organic (incl. regulation, conversion) vs. programmes on sustainable alternatives to conventional • Key role: clusters, farmer umbrella organisations, certification bodies • Often linked to EU projects.	• Advisory service on general aspects, (sales, business development, marketing, internationalization, B2B, etc.) • Insufficient access to extension services for farmers
Pertaining bottlenecks and (future) challenges		
• Lack of trust in knowledge transfer system • Insufficient capacities • Lack of centralized digital information platform • High reliance on EU funding and programme	• No national efforts to develop training programmes for advisors	• No specialized extension services • Service providers unfamiliar with organic farming: certification, conversion etc. • Lack of central coordination to develop advisory services • No formal professional training structures for organic advisors

Based on: Nagy et al. 2023.

Summary of key drivers and barriers in Romania

For Romania, market access and subsidies tied to EU membership had a notable, but not always consistent impact on the development of the organic sector. Phases of stagnation or even de-growth suggest that fairly powerful barriers curb sector development even under conducive conditions (smallholder structure with no chemical use). Apart from the i) strong export orientation for organic (raw) products and the respectively ii) pre-mature internal consumer market, pronounced barriers exist in policy: such as the iii) general distrust in policy support; iv) short-term political interests in EU funding as well as v) strong 'mainstream' lobbying power vis-a-vis a highly divided, and therefore weak farming community. With a better coordinated or equipped AKIS alone such structural barriers are hard to overcome.

3.4.4. Combining key driving factors for different country groups

Although EU Member States are currently situated in a shared EU policy and financial framework, different factors matter for whether the organic sector developed in one country, or experienced only little progress in another. Drawing on the focus country experience, it appeared that specific factors – typically in combination – can be connected to and made sense of in the context of specific groups of countries:

Above average group: Austria and Denmark

Austria and Denmark, represent the largest organic area (AT) and the highest organic share of retails sales (DK) in the EU. One central aspect that stands out in their development as particularly conducive to organic farming in both countries is the **involvement and commitment of the state** as active promoter of organic farming. In addition, in both countries also other mainstream actors such as **large retail chains** or **supermarkets** were heavily involved in the marketing of organic products assuring a **very good accessibility of organic products** for consumers. Although also supply-push measures are in place, Denmark's **demand-pull strategy** promoted organic farming mainly through supporting the establishment of an organic market first. By contrast Austria's predominant **supply-push strategy** was only recently complemented with private and public efforts to promote demand (e.g. public procurement, awareness raising campaigns) building on the situation that **consumer awareness** towards organic food is very high in Austria.

Organic farming is well-defined in **political agreements in both countries**. In Denmark, organic farming is pursued as a goal in its own right, with the aim of making agriculture more sustainable. In Austria, organic farming is seen as one option in agriculture to address the pertaining issues conventional agriculture is dealing with. Overall, in both countries, organic farming is accompanied by ambitious action plans with defined resources.

In Denmark organic farming associations managed to form a **coalition with a range of actors** (e.g. conventional farming actors, consumers). Engaged in **internal conflicts** Austrian **organic farming associations** had only little influence on organic market development and weakened their position vis-à-vis the state and conventional farming. Organic farming was **integrated into mainstream agricultural extension and advice services** in both countries at a very early stage. Well-functioning **peer-to-peer-networks** support organic knowledge capacity building among farmers in Austria. **To a certain extent** Austria and Denmark benefit from their small size, where it may be easier for stakeholders and policy makers to engage and collaborate. **Research and development funds** are granted in both countries, whereas Denmark invested especially in research related to market development.

Average group: Germany, France and Italy

Although just average in relative terms Germany, France and Italy are key countries in terms of sector development in Europe. Together with Spain they account for more than half of the organic production and consumption in the EU. Policy-wise, organic farming is well-established and institutionalised in Germany, France and Italy. However, the importance of organic farming at state level as well as commitment and reliability of policy support vary across the three countries: In

France the relations with the state are referred to as reluctant, **lacking continuity and commitment**. Maintenance payments introduced in 2008 were temporary withdrawn in 2018. State relations seem generally supportive in Italy (e.g. subsidies), but overall passive. Policy commitment in Germany for organic are firm and long lasting, though more recently slowly shifting towards agroecological measures in conventional agriculture. This led to **low differences between organic farming area payments and low input systems** in some German states, reducing the motivation for conversion to organic. The implementation of agricultural and rural development policy at federal state or regional levels – typically owed to the large size – distinguishes the three countries from small countries like Denmark or Austria. In fact, **policy support varies quite considerably across regions** in Germany and Italy, an overall obstacle for developing organic farming, because this regional variance also translates into **fragmented extension and advisory services**, as described for Germany. Limited resources hamper innovation in the sector in Italy and France. By contrast the research landscape for organic farming has evolved in Germany, but **new knowledge is not 'prepared'** for practice.

The three countries have had a focus on **supply-push strategies** for many years. **Demand-pull strategies** are in place in all three countries, e.g. public procurement strategies, but several barriers are seen in the overall organic market development that often rest in **a lack of coordination, cooperation and communication** between organic farmers and/or relevant market players or with consumers as in the case of Italy, where only a **low level of consumer awareness** exists of organic products. In contrast to Austria and Denmark, where large retailers have great market power and outreach, specialised grocery stores were highly important distribution points for organic foods in Germany, Italy and France. Organic products compete with **food labels of traditional specialities and/or labels with geographical indications,** which hamper the development of the organic food market in Italy and France. However, traditional specialities are also available in organic quality (e.g. pasta, olive oil), which boosted **organic food exports** from Italy.
While organic farming associations in France and Italy form a diverse and sometimes conflicting community, it is more unified in Germany. The "**modernisation of agriculture" discourse** shaping conventional agriculture for decades, especially in France and Germany, is recently coming under pressure vis-à-vis the crises in agricultural markets. Although organic made it to the mainstream – at least in principle – as an accepted profitable option for farmers, increased resistance and continuous **lobbying against organic farming** from different actors in the farming agricultural policy as well as scientific community is reported for Italy and Germany.

Below average: Hungary and Romania

Organic farming institutions date back to the 1990s or even earlier in Hungary and Romania. The EU accession in 2004 (Hungary) and in 2007 (Romania) as well as**supporting instruments and EU organic market access** pushed sector development considerably. In Hungary, organic farming is well aligned with several agricultural and other public policy objectives, but more or less considered as one of several options as reflected in the level of **organic subsidies,** which until recently was almost the **same as for general agri-environmental subsidies** with less strict conditions to comply with. A **short-term interest in receiving funding and reconvert,** can also be seen in Romania. **High certification costs** in relation to farming income and purchase power are seen as a barrier for organic farming development in both countries.

On the policy level, (human) resources were and are dedicated to the development of organic farming in Hungary and Romania, but organic farming is still confronted with **mainstream lobbying dominance** and a **lack of confidence in supportive government policies** for organic farming in Romania. **Organic farming institutions** are rather weak players in the policy arena and internal conflicts within the organic farming associations hamper the representation of organic farming interests in both countries. In Romania, this role is taken over by individuals of the organic farming community.

In Romania and Hungary, mainstream organisations are involved to some extent in research activities on organic farming as well as providing extension and advisory services to organic farmers. Yet, there is a **lack of coordinated institutional organisation for education and research** in organic farming in Hungary, which is partly compensated by a dedicated research institute in organic farming (ÖMKI).

Export of mainly raw material has been the biggest driver for organic farming development in Hungary and Romania, but it also has undermined the development of a local market. More processors are entering organic farming more recently and **consumers are increasingly interested in organic products**, especially in urban areas, as in Romania. Overall, communication to consumers has increased but is still considered insufficient and the **lack of positive consumer reaction** makes farmers hesitant to convert to organic farming in Romania. Nonetheless, historically **low levels of chemical use in agriculture** in large parts of the country together with **high land fragmentation** and an increasing number of small farms are perceived as highly supporting factors for organic farming development in Romania.

Summary

Figure 19 offers a visualisation not only of the context specific status and pathways of organic sector development for all eight focus countries but also combines them with selected indicators for key factors (policy commitment, AKIS) in comparison to EU average. The first two columns of the organic area development, for instance, reflect the years when the share of organic farmland exceeded 1% or 5%, respectively, and links both “break throughs” with relevant key events identified for each country (3rd column) as ‘triggering’ the expansion seen. When reflecting these events against country specific charts and figures numerous countries share comparable patterns showing a rather steep growth in coincidence of first organic support programmes followed by a period of no growth, partly declining, which may possibly reflect some sort of consolidation of the initial rapid growth. Further growth occurs from 2015 onwards when the 2014-2020 CAP programming was implemented. For countries with a higher area/retail ratio (and export orientation of the organic sector, like Romania, Hungary or Italy) also the access to the EU market may be highlighted. This suggests that factors outside the national realm are involved, although the EU total data shows a much more even development.

Moreover, current organic area targets and the year when the first organic action plan was in place are taken as proxies for policy commitment. The more dots the AKIS column displays the more the agricultural knowledge and innovation system (AKIS) may be perceived as supportive for sector development. The patterns emerging from the figure reaffirm the relevance of policy commitment and respective financial support (e.g. under CAP programming) for sector development but also the role of a conducive AKIS environment.

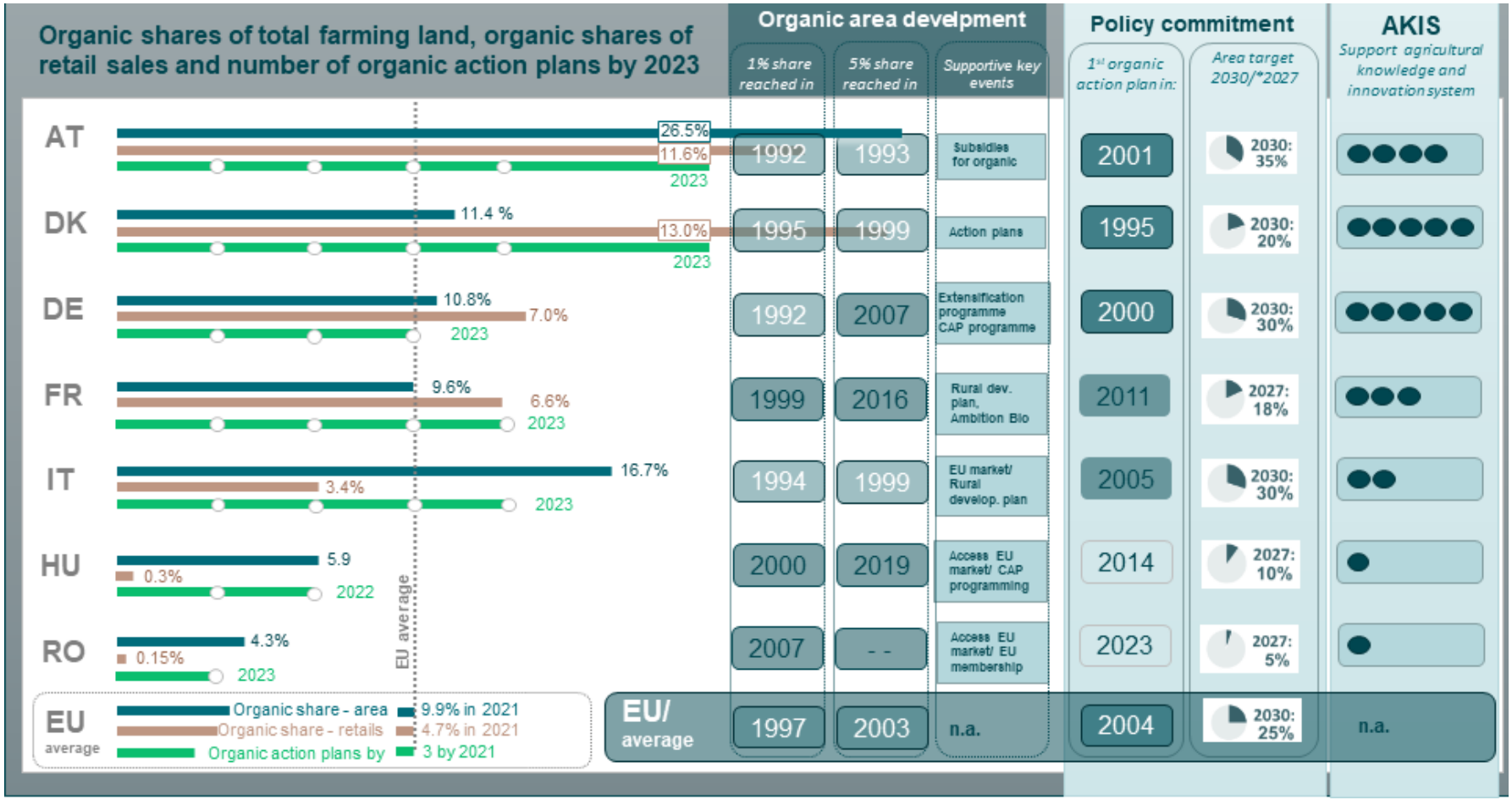

Figure 19. Key indicators for barriers and drivers of sector development for eight focus countries and the EU average

4. Part II: Organic aquaculture

Aquaculture is one of the fastest growing food producing sectors in the world and is an increasingly important contributor to global food supply and economic growth. The share of global supply of fish products for human consumption from aquaculture went from 16% in 1990 to 57% in 2020 including aquatic plants. Nonetheless, the aquaculture sector in Europe is still far from reaching its full potential in terms of growth and meeting the increasing demand for more sustainable seafood. The EU imports over 80% of the seafood that it consumes (EUMOFA, 2022a), while aquaculture production of the EU-27 represents only 1.3% of the world aquaculture production in 2020 compared to China with 56.7% (FAO in: EUMOFA, 2022).

4.1. EU trends in organic aquaculture

Based on EU and national sources, the total organic aquaculture production in the EU-27 was estimated at 73,570 metric tons in 2020 accounting for 6.7% of the total EU aquaculture production. As a comparison, the EU organic aquaculture production in 2015 was estimated at 46,341 metric tons at EU-27 level (49,723 metric tons at EU level), accounting for 4% of the EU aquaculture sector (EUMOFA, 2022b). During the 9-year period from 2012 to 2020, the share of organic in aquaculture production more than doubled from just about 3.3% to around 7% (Figure 20).

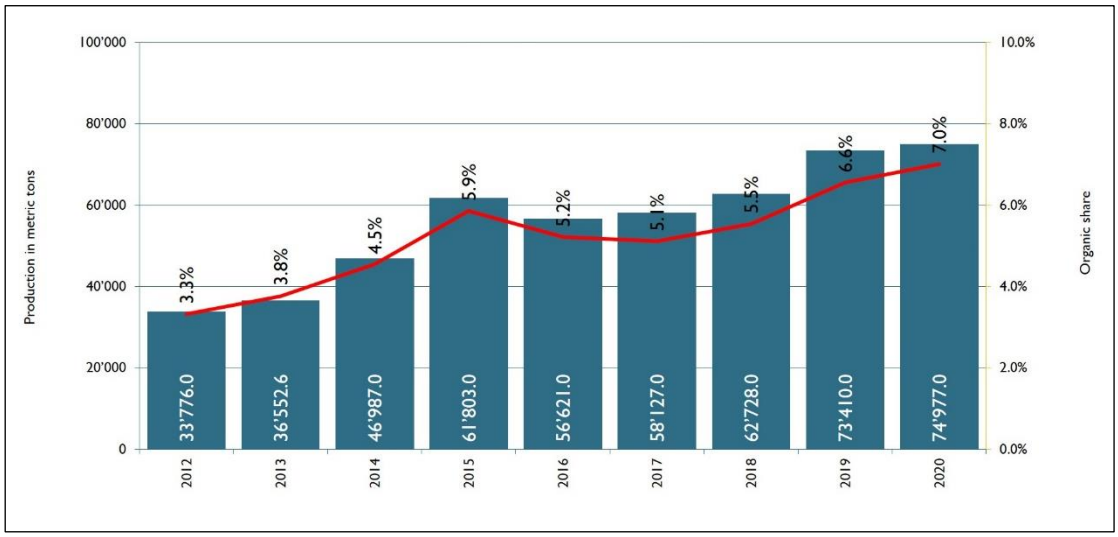

Figure 20. Production growth of organic aquaculture in the EU 2012-2020 (metric tons/ share in %)

Data: Eurostat / EUMOFA / national data, compiled by FiBL/ OrganicTargets4EU (Rees et al., 2023a)

With 18,050 metric tons Ireland has the highest organic aquaculture production, also in relative terms (47.9%). Second is Italy with a production of 9,608 metric ton of organic aquaculture products in 2020, i.e. 7.83% (EU average: 6.73%) of the total aquaculture production. The organic aquaculture production of France, Netherlands, Spain, Germany and Denmark ranged from 5,000 to 10,000 metric tons and that of Bulgaria, Hungary and Greece between 1,000 and 3,000 metric tons. In all other EU countries organic aquaculture production accounts for less than 1,000 metric tons. Table 38 ranks the most relevant species in the EU27 in terms of absolute and relative values of their organic production (for 2020).

Table 38. EU27 organic aquaculture production by species (metric t) and share of total aquaculture production

Species	Total production (2020)	Organic production (2020)	Organic share of total (%)	Organic change from 2015	Main countries
Mussel	409,622	41,936	10%	110%	NL, IT, DE; DK, FR, ES
Salmon	17,095	12,870	75%	-1%	IE
Trout	187,936	4,590	2%	-8%	FR, ES, DK
Carp	85,198	3,562	4%	-49%	HU, RO, LT
Oyster	97,544	3,228	3%	n.a.	FR
European seabass, gilthead seabream	174,501	2,750	2%	38%	GR
Other species	121,900	4,634	4%	n.a.	
Total	**1,093,796**	**73,570**	**7%**	**60%**	

Source: EUMOFA, 2022b

In 2020, the total production of organic aquaculture in the EU was 73,570 metric tons, a 60% increase compared to 2015. In 2020, the main species was by far mussel, accounting for 57% of the total volume followed by salmon (17%). Compared to 2015, bivalves and especially mussel became dominant in the organic production and most finfish species have either stayed stable (salmon, trout) or decreased (carp) except for European seabass/gilthead seabream.

There were 583 organic aquaculture producers in the EU in 2021, an increase by more than 43% from 405 producers in 2012[30]. At the same time also imports of organic aquaculture products trebled from 2018-2021 to more than 15,000 metric tons (European Commission, 2022a).

4.2. Key provisions and support for aquaculture in the EU

The Farm to Fork Strategy and European Green Deal underline the potential of farmed seafood as a source of protein for food and feed with a low-carbon footprint. The F2F also sets specific targets, e.g. to increase organic aquaculture significantly or reduce the sales of antimicrobials by 50% by 2030. The European Green Deal wants to stimulate the economy and to create jobs, while accelerating the green transition. Developing aquaculture as a sustainable food system along those lines implies reducing carbon emissions, reversing the loss of biodiversity, reducing pollution and creating jobs in coastal and rural communities, accordingly.

[30] Because of data inconsistencies for specific countries (e.g. Germany), data is to be interpreted with caution.

4.2.1. EU Strategic Guidelines for sustainable development of EU aquaculture (2021-2030)

In 2021, the European Commission has adopted new strategic guidelines to set the path for EU aquaculture to grow into a competitive and resilient sector and to become a global reference for sustainability by 2030. The new strategic guidelines for the sustainable development of EU aquaculture aim at offering a common vision for EU Member States and all relevant stakeholders for the further development of aquaculture in the EU contributing to that growth strategy. The Commission involved EU Member States, the aquaculture sector and other interested groups and citizens in the preparation of best practice guidelines for the sustainable development of aquaculture in the EU. They want to help building an EU aquaculture sector that:

- Is competitive and resilient
- Ensures the supply of nutritious and healthy food
- Reduces the EU's dependency on seafood imports
- Creates economic opportunities and jobs
- Becomes a global reference for sustainability.

Oriented at key organic principles and EU organic regulation, the guidelines provide a shared framework not only for achieving the Farm to Fork Strategy targets but also for implementing EU regulation on aquaculture more generally and on organic production specifically, e.g. regarding stricter production requirements concerning environmental impact, animal welfare, stock density, or the (limited) use of external inputs etc. They also provide guidance for considering organic aquaculture in spatial planning as well as for promoting low-impact aquaculture systems (e.g. energy-efficient recirculating aquaculture systems) and for diversification to lower-trophic species (invertebrates, algae, or herbivore fish).

Not later than four years after publication the Commission will assess (i) the progress made in developing the recommended actions; and (ii) the efficiency of these actions in helping achieve the objectives, with the possibility of adapting actions accordingly. By 2029, an evaluation of efficiency, effectiveness, coherence, relevance and EU added value will follow to inform next steps after 2030.

4.2.2. Multi-annual National Aquaculture Plans

Building on the Strategic Guidelines and the Common Fisheries Policy (CFP), which place an increased emphasis on the sustainable development of aquaculture in the EU, Member States are required to establish a Multiannual National Strategic Plan for the development of aquaculture activities. MNAPs include Member States' objectives and explicate the funding, administrative and other measures to be pursued as to achieve the expected results. Multiannual National Aquaculture Plans have been developed for the periods of 2014-2020 and 2021-27. Key subjects addressed in many (if not all) MNAPs are:

- Simplification of administrative procedures (including for licenses/ application)
- Coordinated spatial planning for decision making

- Enhanced competitiveness of EU aquaculture
- Support of producer organisations in developing traceability schemes, codes of conduct, or obtaining certifications.

However, overall the analysis of the state of organic aquaculture is poorly developed in the Multiannual National Aquaculture Plans of the countries considered.[31] The objectives and activities aimed at promoting organic aquaculture are marginal compared to efforts spent on key actions for developing "sustainable" conventional aquaculture. Two of the multi-annual national plans (Denmark, Ireland) expressly demand a revision of some aspects of the current regulation on organic aquaculture.

4.2.3. Common Fisheries Policy (CFP)

Fishery is handled under the reformed Common Fisheries Policy (CFP, European Parliament and Council of the EU, 2013) that aims at ensuring long-term sustainability for fisheries and aquaculture, the availability of food supplies and a fair standard of living for fisheries and aquaculture communities along the entire value chain. As a precursor of the European Green Deal and its related strategies, the CFP benefits from the European Green Deal and its emphasis of the triple contribution of fisheries and aquaculture to the economy of and employment in coastal regions, food security in the EU, and the protection of the marine environment. Through the European Maritime Fisheries and Aquaculture Fund (EMFAF, European Parliament and Council of the EU, 2021) and its community-led local development (CLLD, European Commission et al., 2022b), the EU budget provides significant financial support for the improvement of safety and working conditions, development of skills, sharing of knowledge and making the sector more resilient overall.

In the framework of the CFP, the Commission will issue by 2024 four guidance documents as part of the implementation of the Commission communication on the Strategic Guidelines for a more sustainable and competitive EU aquaculture. They will support the sector advancing in the following areas: i) good administrative and regulatory practices, ii) access to space, iv) environmental performance, and iv) climate mitigation.

Beyond the CFP, general EU legislation and EU policies for organic production also apply to aquaculture. Regulation (EU) 2018/848 (European Parliament and Council of the EU, 2018), for instance, promotes, through certification and labelling, aquaculture that complies with stricter production requirements on environmental impact and animal welfare, as well as limited and regulated use of inputs. While the responsibility to implement this legislation and aquaculture management activities lies with national public authorities, the regulation allows EU countries to support their producers on their own terms, while respecting EU competition rules and other policies.

[31] Austria, Croatia, Denmark, France, Germany, Greece, Ireland, Italy and Spain, whose organic aquaculture production represents about 80% of Europe

4.2.4. European Maritime, and Fisheries Fund (EMFF)

The so-called European Maritime and Fisheries Fund (EMFF) is the major financial instrument to implement the CFP. EMFF focuses on the long-term objectives of the Europe 2020 strategy for a smart, sustainable and inclusive growth over the 2014-2020 period. It aims at contributing to sustainable and competitive fisheries and aquaculture and a balanced and inclusive territorial development of fisheries and aquaculture by:

- Helping fishers to adapt to sustainable fishing
- Supporting coastal communities in diversifying their economies
- Financing projects that create new jobs and improve quality of life along Europe's coasts
- Supporting sustainable aquaculture developments
- Easing access to finance for applicants
- Supporting the implementation of the maritime policy.

The current budget for the period 2014-2020 was € 7,790,662,570. 11% of the fund is directly managed by the European Commission to support EU-wide objectives in maritime and coastal affairs. 89% are managed by the Member States through operational programmes, and each country is allocated a specific share of the total budget based on the size of its fishing industry. Spain, for instance, receives almost € 1.4 billion followed by Italy with a little less than € 1 billion. In their operational programmes, Member States set out how the funds will be used during the funding period 2014-20. Once the Commission approves the programme, it is up to the national authorities to decide which projects will be funded. The national authorities and the Commission are jointly responsible for the implementation of the programme.

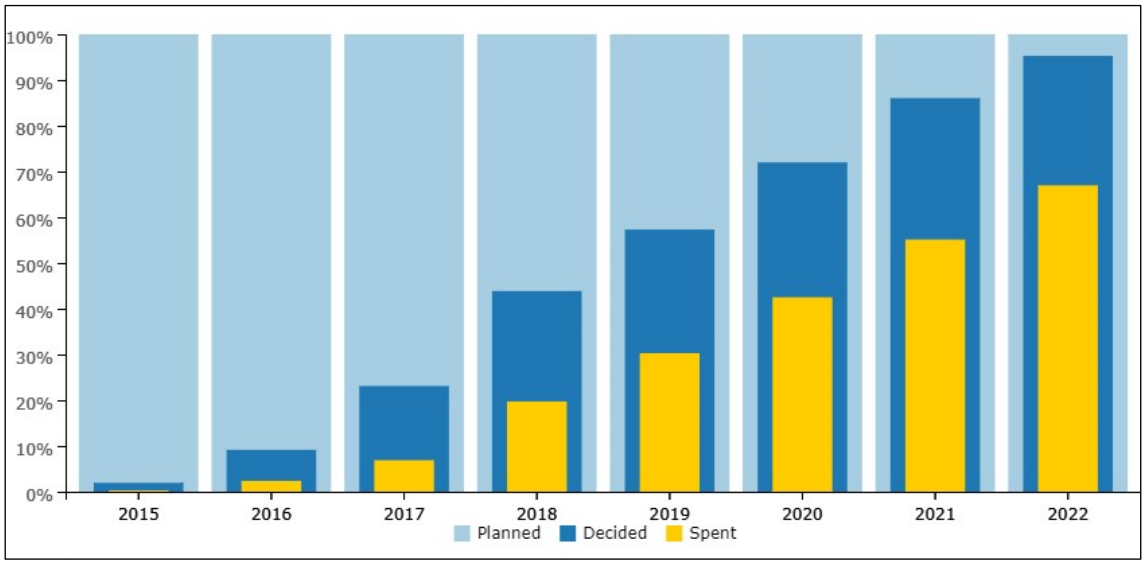

Figure 21. Implementation Progress (as proportion of total cost) of the European Maritime and Fisheries Fund (2015-2022)

Source: Cohesion Open Data Platform of the European Commission; totals may change over time due to 'reprogramming', refresh date: 08/06/2023

4.2.5. European Maritime, Fisheries and Aquaculture Fund (EMFAF 2021-2027)

The EMFAF runs from 2021 to 2027 and supports the EU common fisheries policy (CFP), the EU maritime policy and the EU agenda for international ocean governance. It provides support for developing innovative projects ensuring that aquatic and maritime resources are used sustainably. Projects may be funded that help facilitate the: *i) transitions to sustainable and low-carbon fishing; ii) protection marine biodiversity and ecosystems; iii) supply of quality and healthy seafood to European consumers; iv) the socio-economic attractiveness and generational renewal of the (small-scale) fishing sector; v) development of a sustainable and competitive aquaculture contributing to food security; vi) improved skills and working conditions in the sector; vii) the economic and social vitality of coastal communities; viii) innovation in the sustainable blue economy; ix) maritime security towards a safe maritime space; x) international cooperation towards healthy, safe and sustainably managed oceans.* The EMFAF 2021-2027 total budget currently adopted is EUR 7,800,367,132, with an EU quota of EUR 5,222,972,407 and the national quota of EUR 2,577,394,725. As in the Multiannual National Strategic Plans for Aquaculture, the objectives and activities identified to promote the development of organic aquaculture in the national programmes of the EMFF 2014/20 and EMFAF 2021/27 lacks detail compared to the key actions specified for developing conventional aquaculture "sustainably". Delays and imprecision in the common indicators of achievement of the EMFF (2014/2020) impair to fully assess the degree to which the funds were used for organic aquaculture. However, although the overall funding for fishery (including aquaculture) remained at a constant level between the EMFF 2014/2020 and EMFAF 2021/27 programming periods, funds for aquaculture have increased considerable in

almost all major producing countries (see Figure 22), which suggests an increased relevance of the sub-sector.

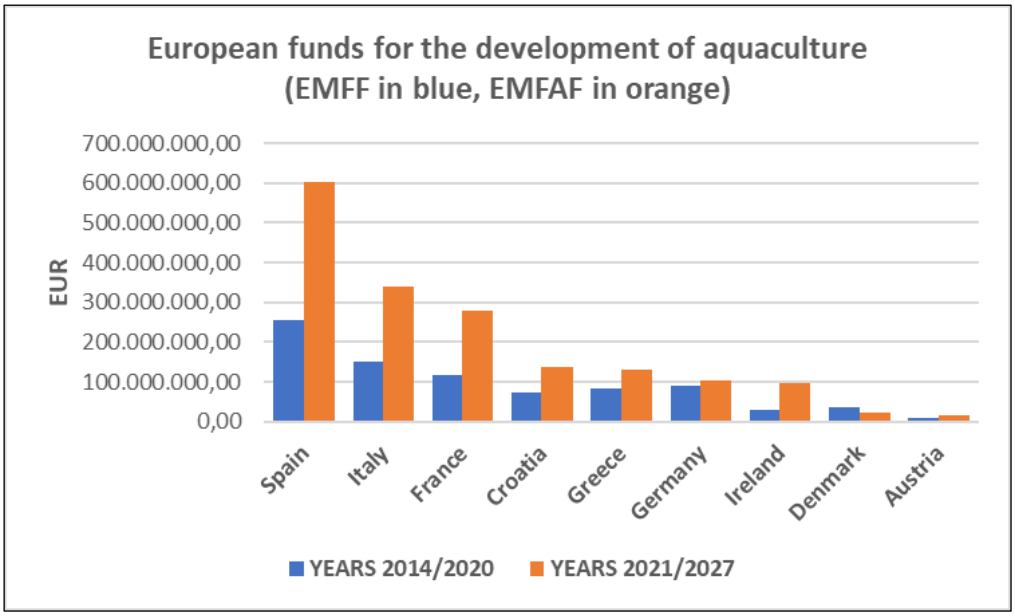

Figure 22. Budget (in EUR) planned by MS for aquaculture development in EMFF / EMFF national programmes

Source: Cohesion Open Data Platform of the European Commission

4.3. Supporting and hindering factors of organic aquaculture development

Contrary to organic farming, organic aquaculture is still at its infancy in the EU, as well as in the rest of the world. This can also be assessed by the low number of relevant documents gathered in the searches in World of Science (WOS) or Scopus (102 in total, not only EU-wide). We carefully reviewed all of them to highlight the most supporting and constraining factors to the development of organic aquaculture in the EU. For efficacy reasons, our literature review for aquaculture deviates from the qualitative content analysis used for reviewing the factors behind organic farming development more generally. The quantitative approach to review yields an interesting overall picture of the relevance assigned to different sub-factors in the different domains (state, society, market) and at different levels for the development of the aquaculture sector.

Spelling out the different factors highlighted in the literature, it appears that the most important supporting factors behind the development of the organic aquaculture on the demand side are *consumer demand and/or willingness to buy* (number of mentions in literature n=35) and *consumer attitude & belief* (n=19). What mattered most, by contrast, for commercialisation on the supply or retailing side are *marketing strategies for organic products* (n=24) and *access to communication and marketing*, respectively (n=20). For the aquaculture practice community *innovation in organic practices* ranks first (n=17). Employing the framework by Michelsen (2001a) a more nuanced picture unfolds regarding the key driving or hindering forces in aquaculture development.

4.3.1. Farmers

Knowledge and skills related to (organic) farming practices (n=5) is the most cited supporting factor of the development of organic aquaculture in the farmer context, next to a pronounced interest in organic farming practices (n=3) and the perception that organic practices are feasible, which is often tied to the level of intensity of prior conventional farming practices (n=3). Experience with the organic sector (n=2) and the accessibility to communication and education, extension, or training (n=2) add to this set of factors, while on the cultural side values, identities, beliefs need to be conducive for taking up (organic) farming practices. A major technical supportive, or typically rather constraining factor, however, is the (limited) availability of, organically produced inputs (n=16, e.g. animals, seeds, feed). It was by far the most important limiting factor, followed by the perceived (non-)feasibility of organic practices (n=5), the inaccessibility to organic markets (n=2), as well as limited or lacking knowledge and skills about (organic) farming practices (n=1) or group pressure and social norms (peer-to-peer effect, n=1).

The organic input problem

In fact, the supply of organic eggs and/or organic juveniles, for on-growing in certified organic farms, is too ambitious, and currently unrealistic (European Commisson, 2016; IFOAM, 2021; OrAqua, 2013), not least because transport is highly costly for small enterprises, a reputational and ecological risk (e.g. animal welfare) and legally restricted (Council Directive on movement of living animals, EC No 88/2006). Principally, farmers avoid introducing animals they deem unsuitable for their local (geographical) environment for various (e.g. genetic) reasons. At the same time breeding for local phenotypes is restrictive for farmers and organic hatchery development is not viable for several species and regions (yet). In fact, several finfish species cannot be reproduced without pituitary hormones, why juveniles cannot be certified. Limited availability of organically produced inputs (e.g. fish feed) adequate for the nutritional needs of different species (e.g. carnivorous), and growth phases (brood stock, fry, juveniles, on-growing) remains a major limiting factor not only for the quality of the final product but also for the development of organic aquaculture (Adámek et al., 2019; EUMOFA, 2022c; Lembo et al., 2019; Mente et al., 2019; Sicuro, 2019). Overfishing of the World's oceans forbids to expand fishmeal and fish oil production for farmed fish feed, while alternative sources of protein (e.g. insect meals, vegetable proteins, algae, or yeasts) are still insufficient for notable replacement (Mente et al., 2019). Unavailable or restricted supplements in feed make it difficult for the feed industry to comply with organic requirements.

Factors surrounding farming

Several more or less important supporting factors are highlighted that rather 'surround' farming practices, e.g. that environmental benefits and ecosystem services may motivate aquaculture practices (n=10); or that resources need to be available for organic research and development (n=12) as well as knowledge and skills for practitioners more generally (n=5) highlighting the key role that knowledge and innovation systems (AKIS) do have for aquaculture sector development.

4.3.2. Farming community

In relation to the 'farming community', innovation in organic farming (n=17) and private labels and criteria (n=11) are outstanding supporting factors to the development of organic aquaculture. Also, the 'transdisciplinarity (cooperation with practice)', the 'offer/availability of advice and education' and the 'knowledge transfer to actors in organic' were each cited once as supporting factors. Only one constraining factor to the development of the organic aquaculture was mentioned: 'lack of innovation in organic farming'.

Innovation in organic farming (e.g. improving fish feed formulation, alternative protein sources, better nutrient utilization, reduction in waste output, Ballester-Moltó et al., 2017; Mente et al., 2019; Tulli et al., 2012), and, closely linked to that, the need to increase (transdisciplinary) R&D efforts and funding ideally funded by European and national research programmes (Estévez et al., 2019; Martsikalis et al., 2019; Mente et al., 2019) are by far the most clearly articulated (n=29) factors in the literature reviewed.

Quality requirement for organic aquaculture, such as the mentioned prohibition of hormones (derivatives) for fish reproduction, as well as of genetically modified organisms (GMO), recirculating aquaculture systems (RAS) for on-growing phase or antimicrobial and chemical treatments including those using natural or vegetal compounds are key restrictive factors applicable only for organic aquaculture.

Finally, the number of small organic farms with a low scale of production appeared as a significant constraining factor (n=9) for the development of organic aquaculture. Economies of scale offer ways to reduce costs, not only at production level but even at logistic and distribution levels (EUMOFA, 2022b). Disruptive events like the global financial crisis may rather further low scales of (organic) production.

4.3.3. Food market

Consumer demand and willingness to buy, is one of the most cited supportive factor (n=35) or obstacle (n=15), however, partly with reference to specific contexts (e.g. country, market, species, consumer profile) (EUMOFA, 2022b; Gambelli et al., 2019; Pulcini et al., 2020). Willingness to buy is seen as a matter of education, general awareness, or knowledge about organic methods and products. Positive consumer attitudes towards organic are a clear, though not sufficient, factor for the willingness to buy (Birt et al., 2009; Feucht & Zander, 2017; Polymeros et al., 2014; Sicuro, 2019) and distrust in 'supposed' benefits of organic or the certification process was reported to reduce willingness to buy (Adámek et al., 2019; Biermann & Geist, 2019; Feucht & Zander, 2015; Pulcini et al., 2020).

Competition or confusion with other labels like MSC, ASC, or label rouge (n=15) adds to this issue. Multiple sustainability labels or schemes not only act as strong competitors to organic, but they may also confuse the consumer (EUMOFA,2022b). In terms of market development, the price of organic in relation to conventional products (n=29) was a frequently cited hindering factor. Only in rare cases (e.g. salmon production in the UK or seabrass/bream in Greece) the price difference to conventional products is actually sufficient to cover the additional production costs at farm level (EUMOFA, 2022b) induced by higher prices for organic fish feed, lower stocking density and the certification costs. Competitive prices for organic (compared to conventional) products

(n=14) together with the possibility to build on a broad portfolio of organic products (n=12) in reach and accessible to customers (n=8) was presented as relevant support strategy and also the quality of the working relationship along the supply chain was highlighted(n=6).

On the supply side, it is important to offer (a portfolio of) organic products/ or to make organic products accessible in different market structures and especially in local (speciality) stores. The latter is particularly important for small-scale farmers and the long-term establishment and competitiveness of organic aquaculture (Adámek et al., 2019; Budhathoki et al., 2021; Scaliapas, 2019). Diversification of organically farmed species and of processed products (e.g. filleting or smoking) could enhance returns (Adámek et al., 2019; Perdikaris & Paschos, 2010). Local market accessibility for small producers is a very important precondition for the long-term establishment of organic aquaculture in the EU

Incentives for farmers (e.g. premiums) or consumers (subsidised prices) are one concrete, broadly discussed approach in support of organic fish production and marketing (Adámek et al., 2019; Castellini et al., 2012; R. M. Sutherland, 2001). Unsurprisingly, accessibility to communication (n=20) as well as marketing strategies (n=24) help raising knowledge and awareness of the organic sector. Public awareness (n=11) or lack of public awareness (n=13), respectively, were cited as the most important supporting or constraining factors in the literature, which are more or less directly linked to increasing demand. A key focus in organic aquaculture is on promoting consumer beliefs and attitudes regarding food safety, animal welfare and sustainability in contrast to conventional products (Budhathoki et al., 2021) as to increase acceptance and willingness to buy. In this context, the internet plays a key role as the dominant source of information for the public in almost all age groups (except for adults over 46 which prefer prints, radio, TV; FutureEUAqua, 2022).

4.3.4. Agricultural Policy

Generally, the level of bureaucracy in organic farming regulations and rules in combination with high costs for certification (e.g. Adámek et al., 2019; Castellini et al., 2012; EUMOFA, 2022c; Perdikaris et al., 2016) ranges among the key-obstacles (n=18) identified. Clear and simple organic farming regulation and rules are seen as a way to address the issue of high bureaucracy, which is closely tied to the standardisation and harmonisation for eco-certification (n=8). Moreover, the availability of incentives schemes and premiums (e.g. through subsidies, n=14) are considered as most important factors in support of organic aquaculture; and their insufficiency (n=7) as a key constraining political factor, respectively. Policy also plays a role in addressing the need to strengthen research efforts and funding for organic research and development (n=12). High expectations are tied to the improvement of EU organic regulation to overcome structural issues, like the legal constrains to juvenile breeding.

4.4. Putting dynamics and factors in context

In a way, there are several commonalities between aquaculture and agriculture when seeing the bigger picture of sector development on both, the demand and supply side. Still aquaculture has taken a distinctive trajectory especially when zooming in to the details of different countries and species. In the following, we will shed light onto those context-specific variances by comparing

sector development for different species and three distinct focus countries at different levels of aquaculture development.

4.4.1. Species differences

For aquaculture production more generally, and organic aquaculture in specific, there are numerous factors in place for sector development with quite notable differences for different species. Evidently, it matters whether species may be kept in open marine ecosystems, off- or on-shores, or rather in limited freshwater with multiple competitive (human) uses (irrigation, traffic, drinking water). In light of the narrow conditions under which different aquatic species prosper, aquaculture for specific species is typically limited to very specific regions and countries. In 2020, for instance, 57% (or 41,936 metric tons) of the total production volume of organic aquaculture (73,570 metric tons) concerned mussels, followed by salmon (17%, or 12,870 metric tons). Organic mussels are produced in a number of countries, particularly in the Netherlands, Italy, Germany, Denmark, France and Spain. While bivalves (especially mussel) became dominant in organic production (compared to 2015), most finfish species stayed either stable (salmon, trout) or decreased (carp), except for European seabass/gilthead seabream.

Organic salmon farming

While data gaps persist on the species, organic salmon is the second most important product in organic aquaculture in the EU (12,870 metric tons certified, 17%). Major producers are Norway, UK, Iceland and Ireland. Generally, and what differentiates organic salmon from other aquacultural products, price margins range well above those for conventional salmon, especially in the UK (EUMOFA, 2022b). However, demand and price seem to rest in a limited and therefore fragile consumer understanding of what 'organic' salmon (Sutherland, 2001), or more generally, food safety, animal welfare, or sustainability, mean in salmon aquaculture (Budhathoki et al., 2021). There is a need for more reliable, evidence-based, information for differentiation as well as local (specialty) stores to promote consumer purchasing habits (Budhathoki et al., 2021).

Organic trout farming

With 4,590 metric tons, organically certified trout is the third important species in the EU organic aquaculture market. France accounts for half of the production (with 2,346 metric tons), followed by Spain (917 metric tons) and Denmark (642 metric tons) (EUMOFA, 2021). The share of organic trout production in the EU is 2%. The main interconnected constraining factors to the development of the organic trout farming in the EU are the quality requirements for organic products (including feed), and the unavailability of organically produced inputs, especially organic feed responding to the nutritional needs of this carnivorous species in different growth phases (Mente et al., 2019). While compliance with organic regulation remains an issue for the feed industry and has contributed to an increase in fish feed prices, consumers' willingness to buy seems unbroken, translating into considerable price premiums for organic trout products, e.g. in Germany (Ankamah-Yeboah et al., 2017). At least for organic trout, information about animal welfare associated with the organic label was highlighted as a key factor behind consumer choices (Ankamah-Yeboah et al., 2019).

Organic carp farming

Carp ranks fourth among the most important species in organic aquaculture in the EU (3,562 metric tons, 4%). Carp farming is mainly carried out in Mid-, Eastern and South-Eastern Europe (e.g. Czechia, Poland, Hungary, Romania, Lithuania, Bulgaria, Croatia, Germany) (EUMOFA, 2021) and mostly pond-based. Overall, the shift from conventional to organic pond cultivation methods is hardly as demanding as for some other species. However, a combination of low consumer demand (disadvantageous preferences for carp), limited market access for small producers as well as high bureaucracy and costs for certification, prevent carp farmers from converting (Adámek et al., 2019). Most importantly, there is no public support for organic production that could support the conversion (Adámek et al., 2019), while price premiums do not fully cover the extra costs tied to conversion and organic production of carp (OrAqua, 2015; EUMOFA 2022c).

Organic seabass/seabream farming

European seabass and gilthead seabream are farmed more or less equally across the Mediterranean. In 2020, 57% of the organically produced 2,750 metric tons (1.5% of EU production) were caught in Greece, followed by Spain, France and Croatia (EUMOFA, 2022a). Complicated bureaucracy marks a major barrier to further organic seabrass and seabream production. The lack of market demand (Perdikaris & Paschos, 2010) is linked to high production costs in the Mediterranean region (EUMOFA, 2019, 2022d), which are compensated insufficiently through 'price premiums'. (Research on) the formulation and quality of organic feed ingredients needs to improve to ensure nutritional quality and market value of organic seabass and seabream (Mente et al., 2019; Di Marco et al., 2017). Likewise, better marketing and communication are needed to move beyond niche market products (Paraskoulakis, 2015; Perdikaris & Paschos, 2010).

Organic shellfish farming

Organic shellfish farming significantly contributes to production (57%, 41,936 metric tons) and marketing of organic fish in the EU, including 3% (3,228 metric tons) organic oyster production, almost exclusively located in France. Little is known about enabling or constraining factors for organic mussel farming, and mainly for the producer countries Spain, France and Italy. However, one aspect highlighted is the competition with other (sustainability) labels, such as MSC (EUMOFA, 2022b). Linked to that, communication barriers exist regarding the added value of 'organic' shellfish aquaculture products. For future sector development, the fact that organic aquaculture requires water classified A since 2022 (according to Regulation 2018/848, the Water Framework Directive (WFD): Directive 2000/60/EC and Marine Strategy Framework Directive (MSFD): Directive 2008/56/EC) might lead to the exclusion of some areas classified as B. Although Member States may authorize the introduction of max 50 % of non-organic juveniles for on-growing purposes on an organic production unit, this Directive could be restrictive for oysters, because organic hatcheries are still not developed; and restrictive for mussel, because mussel seeds are collected from natural areas.

4.4.2. Focus country findings

This section presents context-specific figures, facts and insights on aquaculture sector development for three fairly distinct countries (Germany, Greece, Italy) on:

- The **country's** general **sector development** trends between 2012 and 2020 based on time series for both production and producers
- **Key events** in policy, market or society specific to the country that stand behind developments with a special focus on **agricultural policy and support**: highlighting the most relevant policy and financial support schemes
- Structure, opportunities but also bottlenecks and challenges of the national **AKIS** specifically for organic aquaculture, covering a) knowledge creation in research and innovation (e.g. at universities), as well as the systems in place for b) education and training and c) extension or consultancy on organic aquaculture,
- A **summary** of the country specific key **drivers**, lock-ins and barriers

Germany

Unlike the development seen in agriculture, the organic aquaculture sector in Germany experienced a rather abrupt growth and only since 2018 after a decrease in the years 2014 and 2015; followed by strong growth in 2016 and a substantial drop in 2017. Ignoring the deviation in 2017, the rise in production in 2018 by more than 2000 % is still remarkable when considering the stagnation in the aquaculture sector in Germany more generally (EUMOFA, 2022).

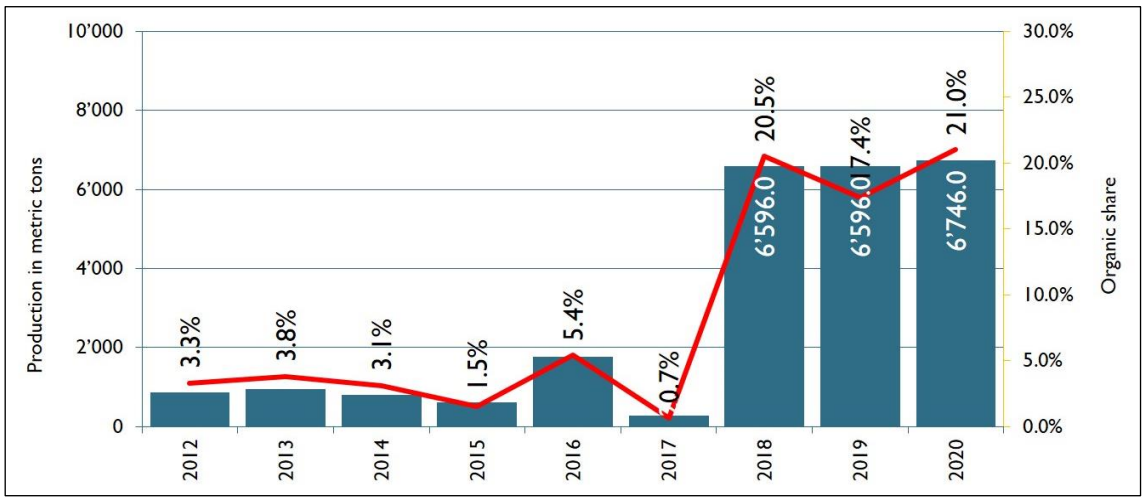

Figure 23: Germany: Development of organic aquaculture production 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU[32]

[32] Rather than suggesting a sharp reduction in production in 2017, the large fluctuations in the figure are most likely the result of data inconsistencies and gaps on (organic) aquaculture more generally.

However, it is unclear what caused the fluctuations or if it rests in data inconsistencies. In 2020, 6,746 metric tons of organic aquaculture products were produced, ten times the amount produced in 2015 (621 metric tons). In 2020, already 23% of total aquaculture production in the country was organic (EUROSTAT, 2023a) which is a considerably higher share than what seen for organic farmland in Germany (10.2%).

In 2012, Germany had 181 organic aquaculture producers, and just around 50 in 2020, most of them small scale. Unlike other countries and considering the general growth of the sector, Germany has experienced a considerable concentration (see Figure 24).

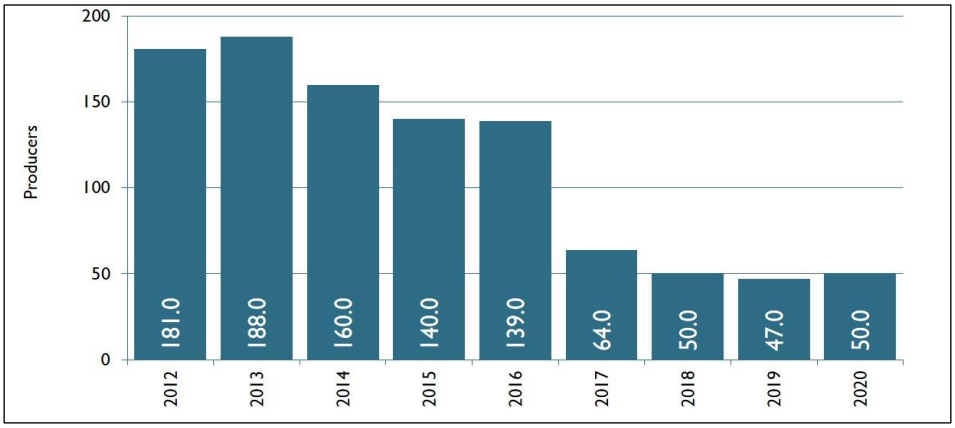

Figure 24: Germany: Development of organic aquaculture producers 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU

Key events and policies behind aquaculture development in Germany

Notable development took place already in the 1990s associated with the first aquaculture standards in Germany in 1995, and internationally in 1996, for organic production. The introduction of the German 'Bio' label in 2001 as well as the implementation of the EU-wide organic aquaculture regulation, launched in 2007 as part of the EU regulation on organic farming, provides further legal backing to the sector development. With the launch of the Aquaculture Stewardship Council (ASC) label in 2010 sustainable alternatives to organic aquaculture products came to play. Since around the same time, several 'conventional' supermarket chains have considerably extended their (own) organic assortments, covering aquaculture. Rewe's cooperation with Naturland since 2009 marks one of the earliest. The new organic regulation published in 2018 and the Green Deal in 2019 are notable events. The overall market decline for organic after 2021 related to the loss of purchasing power vis-à-vis high energy costs is expected to also affect aquaculture.

- Policy support for aquaculture

The German organic aquaculture is regulated since 1996 with established standards, like Naturland, helping to improve orientation at farmer needs and addressing conflicts (Naturland, 2023). In the last decade a range of policies targeting employment, fishers' welfare and the sustainability of the sector more generally were put in place. However, there are no policy objectives specifically for organic aquaculture among the priorities in the multiannual plan 2014-2020. Also, the National Strategic Plan for Aquaculture in Germany 2021-2030 deals only marginally with organic aquaculture. For the future development of the sector the European Maritime, Fisheries and

Aquaculture Fund Programme for Germany (EMFAF; 2021-2029) is deemed key. Of the roughly € 300 million allocated to Germany under the EMFAF 2021-2027 more than € 100 million are earmarked under Priority Area 2 (Fostering sustainable aquaculture activities, and processing and marketing of fisheries and aquaculture products, contributing to food security).

In fact, the specific objective 2.1 (*Promote sustainable aquaculture activities, in particular strengthening the competitiveness of aquaculture production while ensuring the long-term environmental sustainability of these activities*) explicitly mentions conversion to organic aquaculture and certifications according to organic or other sustainability standards. Under specific objective 2.2 (*Promote marketing, quality and added value of fishery and aquaculture products, as well as the processing of these products*), the sale of organic products is referred to as one response to new market demands.

Knowledge and innovation systems relevant to the organic aquaculture sector

The German KIS landscape for organic aquaculture is complex and characterised by a lack of coordination and innovation. While self-organised platforms and approaches are currently making up for the deficiencies in the KIS for organic, more central coordination is needed considering the remarkable growth of the organic sector. So far, such a need to implement an effective knowledge and innovation system for organic aquaculture is not addressed by national policies.

Table 39. Support structures of the aquaculture knowledge and innovation system in Germany

Key policy frameworks in support of AKIS		
• European Maritime, Fisheries and Aquaculture Fund (EMFAF) 2021-2027 Programme for Germany as general framework with 69 million EUR for sustainable aquaculture / processing • No concrete policy objectives on organic aquaculture in CAP SP; political plans on SDG 14 • Aquaculture specific AKIS not covered in policy targets		
Research and innovation	**Education and training**	**Extension and advice**
• Most research targets conventional production	• Curricula in vocational schools or academia designed around conventional topics	• Many services for conventional: processing, retails and imports • Certification organisations key advisory service
Pertaining bottlenecks and (future) challenges		
• Lack of funding for research in organic aquaculture • Lack of practice-oriented research & exchange • Lack of central innovation hub for organic aquaculture.	• Negligence of topics connected with organic aquaculture	• Limited support on market information & business development • Limited focus on importers or large retailers.

Based on: Nagy et al. 2023.

Summary of drivers and barriers to aquaculture development in Germany

For Germany, several factors relate rather to market (demand) than production (supply) development. Competition and/or confusion with other labels (e.g. MSC, ASC, label rouge) is a relevant constraint for the growth of the German organic aquaculture. While a bigger proportion seems to rely on the ASC ecolabel for purchase decisions (Ankamah-Yeboah et al., 2019), the large number of existing labels causes confusion and distrust (Zander et al. 2018), referred to as a 'label overkill' or information overload effects (Janssen & Hamm, 2012; Altintzoglou et al., 2010). While this undermines the value of labels for consumer decisions (Verbeke et al., 2008), this effect may be counter-acted by raising awareness about the qualities of organic farming practices associated with the organic label (stocking density, limited use of antibiotics, no GMO, no hormones, environmental impact or animal welfare) (Ankamah-Yeboah et al., 2017). In this regard, positive or neutral reporting about aquaculture in German print media (Feucht & Zander, 2017) might support awareness raising as to trigger a higher willingness to buy to a certain extent. Beyond that, especially the high costs of certification for farmers and the limited availability of German organic products compared to the international offer are identified as key constraining factors (EUMOFA, 2022b), among other things.

Greece

1,574 metric tons of aquaculture products were produced in 2020 (+119% compared to 2015, see Figure 25). This is a share of only about 1.2 % of the total aquaculture production of the country (130,792 metric tons, Eurostat); well below EU average for aquaculture (8.9%) and below the share of organic farmland in Greece in 2020 (10.1%). Aquaculture production growth in Greece is lower than that of other countries analysed.

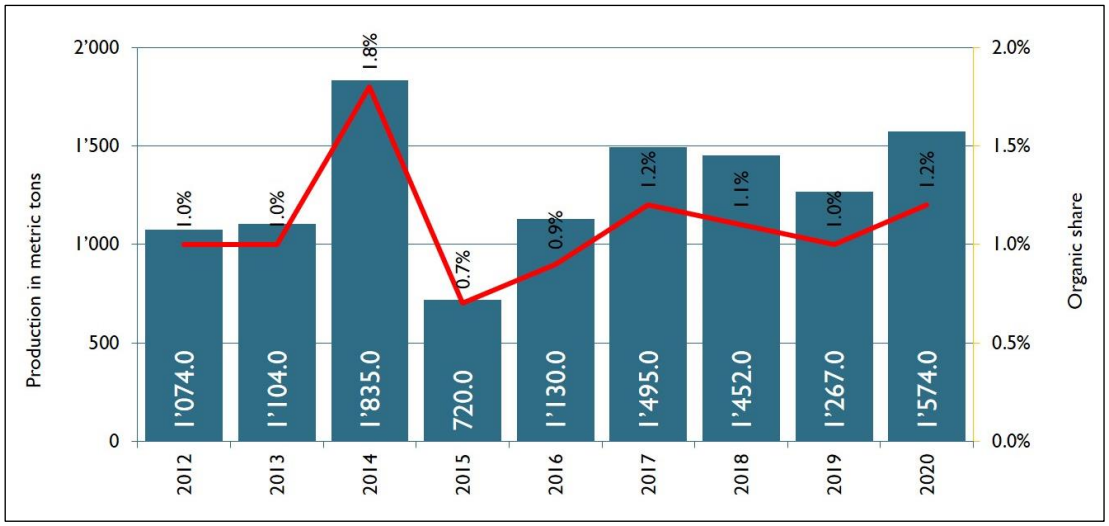

Figure 25: Greece: Development of organic aquaculture production 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU[33]

Seabass and seabream are the species with highest production shares. Eleven aquaculture producers were counted in total (Eurostat 2020, see Figure 26).[34]

[33] Rather than suggesting a sharp reduction in production in 2017, the large fluctuations in the figure are most likely a result of data inconsistencies and gaps on (organic) aquaculture more generally.

[34] Inconsistencies in different data sources can partly be attributed to different categorizations, e.g. numbers (like here) may be higher if they include partially certified/ conventional producers.

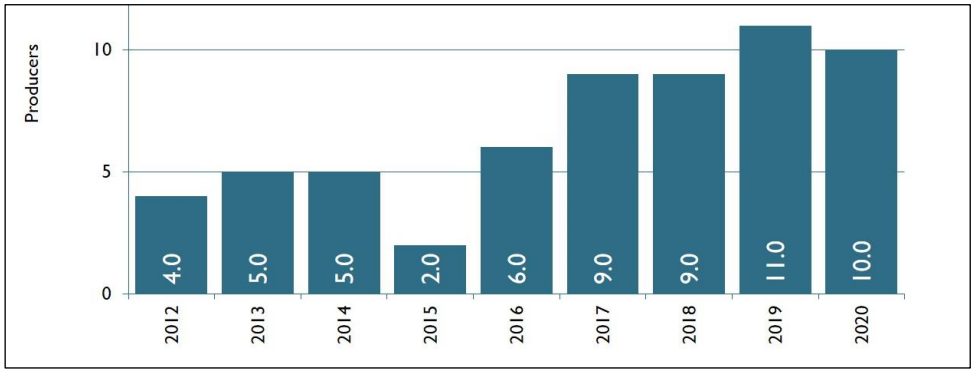

Figure 26: Greece: Development of organic aquaculture producers 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU

Key events and policies behind aquaculture development in Greece

Organic aquaculture seems rather in a stage of stagnation when looking at the developments of the last decade, which follows no straightforward pattern of growth or decrease. Those dynamics are hard to relate to clearly identifiable key events in policy, markets or society. The few increases identified for 2014, 2016, and 2017, may link to changes in EU regulation relevant for organic aquaculture, such as the Implementation Regulation No 1030/2013 on the prorogation of nationally accepted organic rules from 2013 or No 1358/2014 with amendments on aquaculture juveniles, stocking density and husbandry practices, feed products and dietary needs in 2014, both tied to Regulation (EC) 889/2008.

Policy support for aquaculture

The Multi-annual National Strategic Plan for Aquaculture Development (2021-2030) stands as the sector's primary policy document. It only mentions organic aquaculture as a future potential on sustainable production, while highlighting the importance of using recycled water systems (RAS) and integrated multi-trophic systems (IMTA). It emphasizes the necessity for uniform certification processes for both domestically produced and imported aquaculture goods to ensure a healthy competitive environment. The Multiannual National Aquaculture Plan (2014-2020) identifies organic aquaculture methods explicitly as one key objective among other forms of aquaculture with low environmental impact, ecological management and control systems.

Moreover, the annual plan suggests the conversion of conventional aquaculture production to organic aquaculture, participation in ecological management and ecological control systems, promotion of methods that contribute to conservation and improvement of the environment, biodiversity, landscape and of the management of traditional aquaculture areas. Under the EMFAF 2021-2027, Greece was allocated a total of € 519.6 million and the operational programme supports the development of organic aquaculture within Priority Area 2 (*Fostering sustainable aquaculture activities, and processing and marketing of fisheries and aquaculture products, contributing to food security*) and its specific objectives 2.1 and 2.2 with almost € 130 million.

Knowledge and innovation systems relevant to the organic aquaculture sector

Research and knowledge transfer for organic aquaculture are well-supported, though very few actors and institutions provide advisory services. More research and innovation are needed together with an effective knowledge exchange to allow key actors to acquire the competencies for further development of the sector (Multi-annual National Strategic Plan for Aquaculture Development, 2021-2030) (European Commission, 2023). Many initiatives remain isolated and not fully effective if there are no clear national targets at policy level and infrastructure that should support the knowledge and innovation system. Many initiatives remain isolated and not fully effective if there are no clear national targets at policy level and infrastructure that should support the knowledge and innovation system.

Table 40. Support structures of the aquaculture knowledge and innovation system in Greece

Key policy frameworks in support of AKIS		
• The Multi-annual National Strategic Plan for Aquaculture Development (2021-2030): organic aquaculture as 'future' sustainable option; KIS: R&I and dissemination of results, promote cooperation among actors, networking, improvement of knowledge and training.		
Research and innovation	**Education and training**	**Extension and advice**
• Researchers and farmers well connected and collaborating.	• Well-established practice-oriented advisory system (research, universities) • Several advanced trainings for interested students	• Advisory services sufficient for few certified aquaculture farms • Key role of research/academia
Pertaining bottlenecks and (future) challenges		
• Insufficient links of research to policy arenas, general public and stakeholder		• Limited number of experts / demonstration sites for extension services limit further development

Based on: Nagy et al. 2023.

Summary of drivers and barriers to aquaculture development in Greece

The obstacles in Greece are the complexity of the bureaucracy in organic aquaculture rules, regulation, and certification costs; as well as the unavailability of incentives, the price difference between organic and conventional aquaculture products and the demand, unavailability of organic fish feeds and juveniles. The supporting factors are consumer attitude and beliefs and the research on the technical solutions and innovations in organic aquaculture.

It is advantageous that the aquaculture sector in Greece is small, because it eases effective collaboration and communication between actors as the basis for sector development. However, it is also too small and the costs for organic production, especially the certification, are too high. Moreover, the incentives for conversion are insufficient and the support provided inconsistent (and partly unknown) to farmers. Adding to the situation, is the unavailability of inputs (esp. fish feed and juveniles) and high levels of bureaucracy.

The significant price difference between organic and conventional aquaculture products impacts on consumer demand and willingness to buy as the most important constraining factor in Greece. Although consumer attitude and beliefs are supportive factors in Greece, consumers are only insufficiently informed about organic aquaculture production. Accessibility to communication and respective marketing strategies for organic products are considered crucial to enhance public awareness regarding organic farming practices and to develop organic aquaculture in Greece. In Greece, and due to the low scale of organic aquaculture production, the market is very susceptible to crises. The decreasing purchasing power (due to the COVID-19 pandemic and energy crisis) negatively impacts consumer demand, considering that organic products are typically more costly than conventional ones. In terms of overcoming pertaining technical constraints in production, innovations in organic aquaculture are seen as a key supportive factor.

Italy

After Ireland, Italy is the country with the second highest organic aquaculture production. In Italy in 2020, 10,167 metric tons of organic aquaculture products were produced, which account for around 8% of the total aquaculture production. While this share was higher than EU-27 average (6.4%) in 2020, it is lower than that of organic farmland (16 %) in Italy. Aquaculture production growth in Italy was constant and considerably higher than that for the EU with the production value in 2020 being seven times higher than that in 2012 (1,379 metric tons) (see Figure 27).

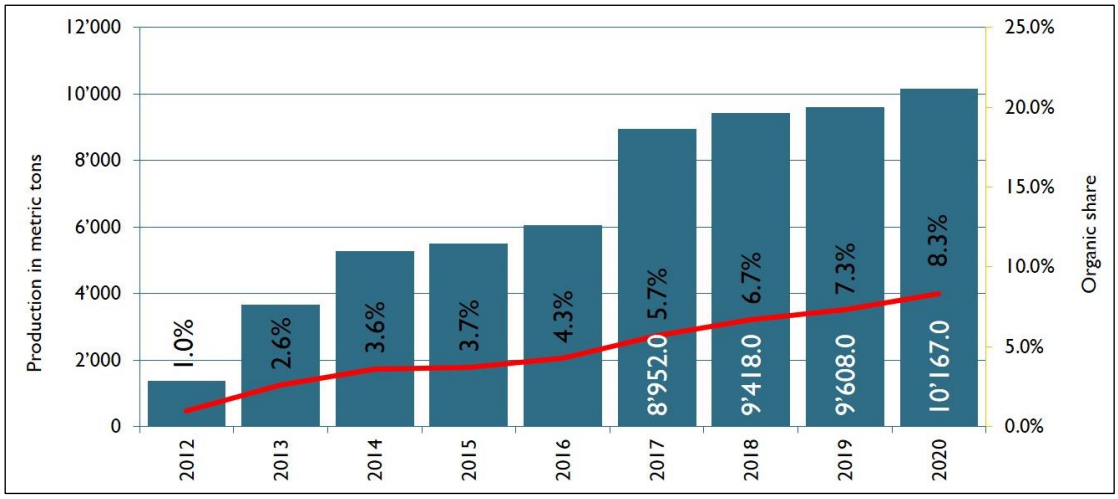

Figure 27: Italy: Development of organic aquaculture production 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU.

Also in Italy, the production of organic mussel is dominant, accounting for about 80% of total organic aquaculture production. Other species produced organically are: Japanese carpet shell, Rainbow trout, European seabass, Gilthead seabream and Oyster.

While the number of organic aquaculture farms was relatively stable between 2014 and 2017 (41-42)[35], more producers entered the market since 2018 (see Figure 28). Aquaculture farms are concentrated in two northern regions: Veneto and Emilia-Romagna with 12 aquaculture farms in each region in 2018.

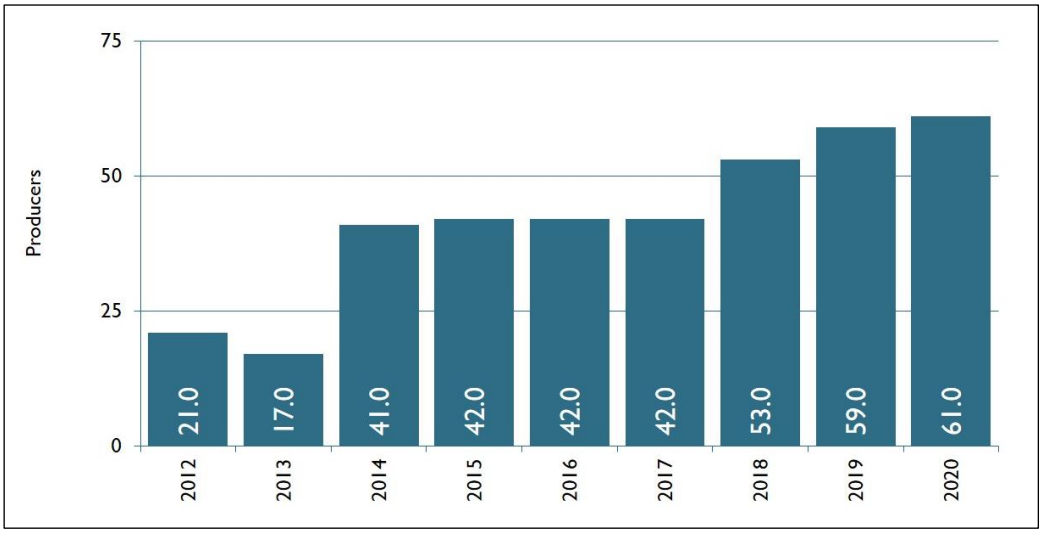

Figure 28: Italy: Development of organic aquaculture producers 2012-2020

Source: Eurostat; compiled by FiBL/OrganicTargets4EU

Key events and policies behind aquaculture development in Italy

As for other countries changes in aquaculture regulation at EU level matter for how the sector develops. One important aspect for the diffusion of organic aquaculture in Italy according to the literature was the adoption of shared and standardized procedures with the introduction of Reg. (EC) 710/2009 (Sicuro, 2019). However, within the EU framework that Italy shares with all countries engaged in aquaculture, the "*Multiannual National Strategic Plan for the development of aquaculture activities*" adopted in Italy, as well as the Italian programme of the EMFAF 2021-2027 can be described as supportive drivers behind the development.

Policy support for aquaculture

Italy is a country with several aquaculture-specific policy measures in place. While there is a general component on aquaculture in the "National Strategic Plan for the Development of the Organic Farming Systems 2016-2020", also the "National Strategic Plan for Aquaculture 2021-2027" specifically refers to organic aquaculture. In the current multiannual action plan for aquaculture, the following priorities with relevance for organic sector development are established:

[35] Data inconsistency in Eurostat data compared to Pulcini et al., 2020 as cited in EUMOFA, 2022. Almost identical numbers in the Eurostat data from 2014-2017 suggest pertaining data gaps.

- Promote and support sustainable aquaculture systems (aquaponics, multi-trophic aquaculture, lagoon fish farming, etc.) that provide environmental services, including through support for organic certification.
- Higher priority on mitigation of environmental impacts, through new/modern aquaculture systems with reduced GHG production and CO_2 sequestration function. Rewarding companies that obtained or pursue sustainability certifications (e.g. organic certification).
- Promote adoption of sustainable, highly eco-compatible production models by aquaculture farms with efficient use of resources that improve the environmental performance of production activities (e.g. organic certification).
- Support of conversion of conventional towards organic aquaculture production methods to qualify Italian products in competition with imported products.

Similar to the Multiannual Aquaculture Plan, objectives and activities aimed at promoting the development of organic aquaculture in the national programme of EMFAF 2021/27 are not defined in detail or clearly delineated from key actions identified for the development of a 'sustainable' conventional aquaculture. Still, the EMFAF operational programme supports the development of organic aquaculture in Italy among other things especially under Priority 2 (Sustainable aquaculture activities, processing and marketing). Around € 340 million out of the total budget of ca. € 987.3 million are dedicated to the specific objectives 2.1. and 2.2 with relevant activities (under 2.1) being studies and research on organic management of fish farms (e.g. genetic improvement, juvenile stages, feed) as well as the conversion of conventional aquaculture production methods to organic aquaculture; increasing the number of organic aquaculture operators by a further 5% compared to the 2014-2020 period. A key activity under 2.2 is to facilitate access to new markets and/or better marketing conditions for products obtained with methods with limited impact on the environment and/or organic aquaculture.

Knowledge and innovation systems relevant to the organic aquaculture sector

Organic aquaculture research programmes have been already initiated in Italy, involving both research and practice. These initiatives address technical aspects and consumer perception. However, a more strategic and consistent approach is necessary for the development of the sector. Furthermore, while aquaculture farmers receive consultancy support in the certification process, training is scarce. The current advisory system lacks focus on market integration, branding, or marketing strategies, essential for the sector's success. Given the fragmented network of actors and the limited interest in organic aquaculture from private advisory services, greater institutional commitment is required.

Table 41. Support structures of the aquaculture knowledge and innovation system in Italy

Key policy frameworks in support of AKIS		
• Ministry of Agricultural Policies (General Directorate for the Promotion of Agribusiness Quality) funding for R&I projects for organic aquaculture • National Strategic Plan for Aquaculture (NSPA, 2021-2027) supporting conversion, certification, collection of information, monitoring, and small-scale fish-farmers. KIS indirectly highlighted: foster public-private research dialogue, R&I, training & vocational qualification, knowledge transfer for business needs. • Italian European Maritime, Fisheries and Aquaculture Fund (EMFAF 2021-2027: no defined detail on KIS, but general support of developing sustainable conventional aquaculture.		
Research and innovation	**Education and training**	**Extension and advice**
• Targeted research as basis of knowledge creation & transfer • Farmers involved in technical public /private research (production, processing, etc.)	• Special education /training courses no prerequisite for aquaculture farming. • Special funds to support training	• Certification process key for support to farmers • Focus: technical issues of production
Pertaining bottlenecks and (future) challenges		
• Comprehensive national programme missing • Research initiatives not strategic / frequent enough for well-functioning exchange • Greater producer involvement in research planning needed	• Farmers with little knowledge on organic production methods, marketing • Fund largely unused: little interest from small-scale producers	• Advice not focused at national/ international markets, branding, marketing, etc. • Private advisory system no interest in specific advisory. • No institutional commitment to fill gaps

Based on: Nagy et al. 2023.

Key barriers and drivers of aquaculture development in Italy

Overall, a certain demand for aquaculture organic products (especially for shellfish) does exist and is expected to grow due to environmental and health concerns, but it still appears as a niche market, especially due to a lack of knowledge regarding aquaculture farming and lacking public awareness. A marketing strategy is still pending that employed a range of different communication channels (e.g. internet and social medias), targets the right audience, or informs consumers about organic aquaculture practices as to increase the demand and willingness to buy. Complementary to increasing demand, the accessibility of organic product in places that potential consumers have access (e.g. supermarkets, large fishmongers, or organic food stores) is a key supportive factor. Organically produced fish feed suitable for different species remains a key hindering factor for organic aquaculture development in the country (Sicuro, 2019). It was also found that the price relation between organic and conventional products is still not always sufficient to support the extra costs of the organic aquaculture (EUMOFA, 2022b). High bureaucracy, cost of

certification and competition with other sustainability labels (e.g. ASC, MSC) are further key hindering factors.

Summary

Organic aquaculture is still at its infancy in the EU. The introduction of organic aquaculture practices poses several challenges in the investigated countries. A pertaining issue is the unfavourable price ratio to conventional products, which is insufficient to cover the production costs at farm level (EUMOFA, 2022b) induced by costs for organic fish feed and certification, or the lower stocking density. Literature highlights the role of incentives (e.g. eco-premiums for farmers or subsidised prices for consumers) to support organic fish production and to support marketing of organic fish at reasonable prices for consumers (Adámek et al., 2019; Castellini et al., 2012; Sutherland, 2001). Another important technical factor that hinders the development of the organic aquaculture in the focus countries is the unavailability of organic fish feed adequately designed for the nutritional needs of different species is one of the principal issues hindering the development of the organic aquaculture and affecting the quality of the final product (Adámek et al., 2019; EUMOFA, 2022b; Lembo et al., 2019; Mente et al., 2019; Sicuro, 2019). Indeed, only a very limited number of adequate options exist to better match organic ingredients, amino acid and fatty acid profiles, as well as other essential nutrients, covering the dietary needs for the full organic production cycle. Great effort and large amounts of research funds will be needed to address the pertaining technical problems that still limit the development of organic aquaculture. In fact, some of the constraining technical factors may be addressed by improving the EU organic regulations.

Notwithstanding the broader and commonly shared patterns of key drivers or barriers to sector development for different countries, the high context variability forbids to draw general conclusions across all countries. Aquaculture differs across countries not only in ecological and technical terms (marine vs. fresh water ecosystems; species specificities), but for instance also regarding the socio-economic conditions, like, for instance, purchase power. The pertaining data gaps and inconsistencies on aquaculture add to this inconclusive picture. Table 42 provides an overview of the different key drivers or barriers relevant identified in literature for aquaculture for the three different focus countries (Italy, Germany, Greece) and is illustrative of the variation seen across the different dimensions (policy, market, community).

Table 42. Key supportive and constraining factors of aquaculture development in Italy, Germany & Greece (number of mentions in literature, n=x)[36]

Type of factor	Supportive factors			Constraining factor		
Policy	**Italy**	**Germany**	**Greece**	**Italy**	**Germany**	**Greece**
Clear vs highly bureaucratic rules	(n=1)			(n=2)		(n=5)
Availability of incentives	(n=1)		(n=1)			
Requirements products/price	(n=1)			(n=2)		(n=4)
Trade regulation		:				(n=1)
Market						
Consumer demand/willingness to buy	(n=8)	(n=4)		(n=1)	(n=1)	(n=6)
Access to communication /marketing		(n=4)		(n=2)	(n=1)	
Marketing for organic products	(n=3)	(n=3)				
Competition/confusion other labels				(n=1)	(n=3)	
Public awareness	(n=2)	(n=3)	(n=1)	(n=3)	(n=1)	(n=1)
Offer of organic products/assortment	(n=2)	(n=2)				(n=3)
Accessibility organic products	(n=1)			(n=4)		
Consumer attitude/belief	(n=5)	(n=2)		(n=2)	(n=2)	
Private labels/criteria	(n=3)	(n=1)				
Knowledge about organic products	(n=3)		(n=1)	(n=1)		(n=1)
Price ratio organic vs conventional		(n=1)		(n=5)	(n=1)	(n=2)
Price		(n=1)	(n=1)	(n=1)		
Purchasing power						(n=1)
Community						
Innovation in organic farming	(n=7)					
Research effort	(n=1)					
Number organic farms, low scale					(n=1)	
Available organic inputs				(n=1)		
Interest in organic farming			(n=1)			
Lack of awareness organic farming				(n=1)		(n=1)
Experience with organic sector	(n=1)					
Feasibility organic practices/intensity				(n=1)		
Access info, education, extension	(n=1)					
Standard harmonization	(n=1)					
Supply chain relationship	(n=1)					
Other/surrounding factors						
Environ. benefits & ecosys.services	(n=1)	(n=1				
Climate change, Covid, other crises						(n=2)

Source: Jahrl et al. 2023.

[36] Entries build on the literature review. Information in individual country profiles may deviate in that they also add expert opinion to the patterns.

The literature review highlighted not only a high number of constraining factors to the organic aquaculture development in EU countries, but also different relevance for different countries.

4.5. The way ahead: learning from the energy transition

In sustainability studies, the renewable energy sector is often referred to as a best-practice example for effective market development. Having a look at what drove innovation in this related sustainability field over the past decade in European countries and beyond provides a source of inspiration as to how organic farming could be developed further to maturity. In literature two key areas – 'Macroeconomics & Policy' and 'Networking & Innovation System' – stand out that may be of particular interest to organic sector development also because they refer to the broader picture of what drives transformation rather than individual firm- (or farm) level consideration.

4.5.1. Macroeconomics & Policy

Generally, the stability and continuity of the macroeconomic situation ensures a favourable environment for investments and innovation (Zhang & Kong, 2022). As basis for building trust and confidence in the economy, this factor is only little discussed in the context of organic farming. More attention may be paid to the (indirect) role of monetary or trade policies for agriculture, including to the limitations that globalization holds for sustainability transitions more generally. Wage inequality, for instance, was shown to impede the 'energy transition' in OECD countries (Hu et al., 2022); and it may be important to address the issue for organic sector development, too, be it at the source or at the consumer side, e.g. by supporting the poorest consumers.

Moreover, "green financing", i.e. low interest rates for green activities, can be a powerful tool in enhancing investments for sustainability purposes (Wang et al., 2022), because it alleviates risks, reduces costs, and encourages firms to "cross the bridge". So far it is typically available or used almost exclusively by industry, not by farmers, which evokes questions as to how the farming sector could benefit more directly from green finance and what role policies could play in making farming attractive for the finance sector.

Furthermore, 'deployment policies' have been identified as an important element in supporting sustainable transitions of industries by creating 'positive expectations' about the future state and progress of transitions and by offering protected niches in which markets can develop (Sinsel et al., 2020). In this respect, it is helpful to define clear and specific targets (Lee et al., 2020), as principally seen in the agricultural sector with the EU organic targets for 2030. For putting more flesh on defined sector targets, substantive subsidies and R&D investments are critical for developing an eco-innovation (Horbach & Rammer, 2018), fostering their further development and diffusion (Capozza et al., 2021) or to protect a niche (energy) technology during maturation (Batinge et al., 2019).

In addition, there is a set of different policies that have proven influential in the context of renewables or climate worth to consider for organic agriculture development, such as:

- Corporate law modifications that make shareholders legally liable for environmental impacts (Bergh, 2013). This implies a careful choice of the target group in agriculture and along the value chain, considering the possible impact of such forceful measures on support and 'willingness'.

- Radical global strategies: e.g. pursuing low carbon strategies (Capozza et al., 2021).
- Combination of environmental regulation and innovation support (Bergh 2013) that offer opportunities for proactive development not just restrictions.
- Tradeable emissions permits (Capozza et al. 2021). In agriculture, this could be translated into capped and tradable "pollution" permits (e.g. use of pesticides).
- Feed-In Tariff (FIT), that offer a guaranteed, above-market price for RE producers (Guidolin & Guseo, 2016) while additional costs are shared across all energy products through a levy. In a way 'higher prices' for non-organic products in agriculture would offer a way of internalizing negative externalities.
- Tax breaks (Chapman & Itaoka, 2018). So far tax breaks (meaning also a reduction of public income) are typically omitted from consideration in agriculture, although they may offer an interesting alternative or complement to subsidies (a public spending).
- Demand side-related subsidies for consumers (Defeuilley, 2019), such as the US "food stamps" scheme, are relevant measures
- Private-public partnerships (PPP), e.g. between groups of investors, regional governments, utilities and manufacturers (Chapman & Itaoka, 2018).

4.5.2. Networking & Innovation System

Seeing innovation as a multi-actor and systemic process that requires systemic changes, it is critical to extend discussions of acceptability of certain technologies beyond just certain stakeholder groups or certain locations. All sorts of transitions will disadvantage certain actors (often outside the sector). Participatory processes help reducing possible conflicts, because they help understanding what matters to different groups of stakeholders, finding compromises and raising acceptance as basis for a sustainable and acceptable transition (Komendantova & Neumueller, 2020).

Regarding acceptability, it was found that the potential improvement of firms' reputation and image can be a key driver in encouraging a sustainable transition, because it attracts new customers (consumers), or skilled and motivated employees, ensures better access to finance and investment, while increasing sales (Capozza et al., 2021).

Other, complementary policy- and community-related factors behind Networking & Innovation System (Lutz et al., 2017) seem also relevant for organic agriculture:

- Clear and comprehensive planning (e.g. regional planning)
- Monitoring of goals, and use of milestones
- Knowledge exchange with experts and experienced practitioners
- Involvement of 'change agents' and diversified set of skilled actors
- 'Presence' of supporting actors and support by decision-makers
- Consistent legal and policy conditions

On the technical side, better available and interoperable diverse technologies, incl. digital ones ('digital farming'), could greatly support innovation development and diffusion (Lee et al., 2020; Shahbaz et al., 2022; Sinsel et al., 2020).

5. Synthesis of key findings and discussion

In this report, we assessed the key drivers and lock-ins that affect the development of the organic sector for both agriculture and aquaculture in and across different EU countries. In the following, we discuss the main findings of this analytical exercise to identify broader patterns across countries and key lessons learnt. With respect to the distinctiveness of organic agriculture and aquaculture, the findings are discussed mostly separately, yet without the intention to suggest that their development was completely unrelated or common lessons learning impossible.

5.1. Scaling organic agriculture in the EU

Considering the recent trends and developments in the EU organic sector, the organic sector is likely to continue to grow at a steady pace. However, the lacking acceleration suggests that reaching the 25% target by 2030 is not very likely. Organic production in the EU would have to increase until 2030 from 15.6 Mha (9.6%) that were managed organically in 2021 to more than 40 Mha. Although Member States have set targets for organic land area to be achieved by 2027 or 2030, part of CAP Strategic Plans or organic Action Plans, current targets (if met) sum up to just around 20% of EU UAA and below the EU target of 25%. The large differences in sector development even between countries that are early adopters of action plans with clear sector targets, suggest that how MS implement EU policies is as important as overall policy commitment. One key aspect is the level of support for organic sector development and the high variability of payment rates within and between countries and years, which may significantly impact further market development vis-à-vis a highly competitive EU market. While the level of support of some countries was not always consistent with the level of ambition of area development, this may not be interpreted as a lack of ambition overall, not least because the actual costs of conversion remain context specific, depending, for instance, on how intensive prior practices were. There is still no full picture of costs induced by conversion for different countries and types of producers. Likewise, policy support for environmental services that organic land management delivers still differs significantly from support for rural economic development or general CAP payments.

Key drivers and lock-ins of organic sector development

Drawing on an extended version of Michelsen's (2001a) framework our review elaborated on the diverse factors behind different development pathways of different countries. The results support the impression that for actors to be considering and maintaining organic farming in a country, appropriate institutions and cooperation need to be established in and across the farming community, the agricultural policy as well as the food market. For success of organic farming a well-established supporting system across all domains (e.g. policy support, extension services, market access) paired with reliability, legitimacy and a perceived reduction of risk is discussed as a prerequisite or at least a sound basis for considering and maintaining organic farming.

Key lessons learnt from the review and past experience are furthermore:

- **Context matters**: While certain factors, like coordination, are valid across the board, numerous factors are highly context-dependent and hard to generalize. For instance, supporting large and powerful retail chains, as in Austria or Denmark, might not work in countries where the food market is characterized by a variety of sales outlets and players, or which are heavily export dependent. Organic production may also be easier to expand

focusing on extensive grassland management than in **regions** where highly intensive land use systems dominate.

- **Supporting systems are interdependent:** A conducive environment marks the backbone of organic sector expansion. It relates to the relationship of farmers with their farmer community, with agricultural policy and food market institutions. While each subsystem matters in its own right, all subsystems need to be equally developed and solid interrelations established between them to reduce actual and perceived risks for all actors involved. Support payments for farmers, for instance, hardly deliver the desired effects without simultaneously developing demand or training infrastructures. Developing the sector for exports without building awareness domestically, limits the development of organic farming.
- **Support payments are not the only trigger:** Providing financial incentives for conversion or maintenance is a key policy strategy. However, many more factors are relevant, including the perceived peer pressure to convert, perceived risks or the perceived feasibility to convert. While conversion relies on multiple reasons, several, not only economic levers are decisive for staying in or leaving the organic sector. Apart from high prices for organic inputs or burdensome certification or low valuation of organic products, also 'other', possibly very private, factors – such as generation change, which are not specific to organic farming – may stand behind re-conversion or drop out.
- **Values and identity shape organic sector development** in the farming community, policy and supply chain. Images of 'good' farming at individual farmer or 'valued' products at consumer level, but also broader prevailing farming discourses of 'modernisation' may not always be compatible with and supportive for organic sector development.
- **Organic addresses challenges of conventional farming:** Developments in conventional agriculture influence the development of the organic sector (Lesjak, 2008). Often, organic farming capitalizes on critiquing or addressing problems of conventional agri-food farming at the overall system as well as the individual level. At the individual level, farming related problems as well as external shocks, as e.g. the cost-price squeeze in conventional supply chains increase the pressure on farmers to look for alternatives and consider conversion. On the overall system level, developments in conventional agriculture like overproduction, the loss of small family farms or social, ecological or health related 'scandals', like the BSE crisis, created 'windows of opportunities' for sector development in several European countries. In light of recent dynamics in conventional agriculture towards more sustainable practices that receive considerable attention and support under numerous agri-environmental programmes organic farming may have to emphasise more resolutely its comparative advantage and uniqueness.
- **Knowledge and capacity building are key**: In contrast to 'normal' innovation, organic farming is a highly complex multi-level knowledge system (Padel, 2013; Simin & Janković, 2014). Various actors need information, education and capacity building with a particularly steep learning curve at the beginning of conversion. In addition to formal advisory and training systems and organic farming institutions, informal networks and peer groups are key for capacity building and the development of organic farming. However, seeing the role of values, attitudes, identities or social norms in this respect, information

and education or related policy tools may be too limited or slow to exert an immediate impact.

Key lessons from focus country experience

Commitment by political and market actors is key. In both, Austria and Denmark, the state actively promoted organic farming together with powerful supply chain actors, like supermarkets or retailers. Continuity, commitment and clarity characterized the approach that both countries took in developing and implementing political measures in support of organic – based on ambitious and financially well-defined action plans. This stands in contrast to Romania or Hungary where the development seen (on low levels) may mostly be attributed to supportive EU policy instruments, especially considerable agricultural subsidies, and export opportunities. Policy efforts in both countries often lack nation-wide ambition, structure or coordination and still mostly draw on the selective, but dedicated engagement of individuals, pilot projects or clusters.

A key message from the country experience, reaffirming literature review, is to focus policies not only on the demand or supply side. For quite some time countries like France, Germany or Italy have had a focus mainly on supply-push strategies, and only recently turned to demand-pull strategies, which may also help to address the weakness in coordination and communication across the value chain. Complementary, support along the **whole value chain** and across all relevant societal domains (from policy to practice) and regions needs to be consistent. The example of well-established organic sectors in Austria and Denmark show that an active market-development strategy is most promising in which a policy mix of instruments (regulatory, incentive based, information and promotion tools) combines a **supply-push** with a **demand-pull** model at different levels; the farmer level as well as the upstream and downstream supply chain, supported by established institutions within the organic farming community. Adding to the question of how well organic may be integrated across the full value chains, **marketing** strategies and market structures more generally were repeatedly referred to as key drivers or barriers to sector development. (e.g. export vs. domestic, specialised grocery vs. supermarkets). The recent growth trends especially in France, but also Germany and Italy, for instance, related to the diversification of marketing channels entailing not only specialized grocery stores, but increasingly conventional supermarkets as well as direct marketing (e.g. box) schemes for organic products.

By contrast, the export-oriented countries Hungary and Romania are only slowly and regionally developing a **domestic organic market** (esp. in Hungary and urban areas). Higher **consumer awareness** and purchasing power form the backbone of the considerable (domestic) organic consumption in countries like Germany, Austria or Denmark, whereas supermarkets, and specialized supermarkets in the case of Germany, serve as **important market players** for increasing the accessibility to organic products/assortments for customers across a country. As seen in several countries, specific health related events (like COVID-19-) or food and social scandals in the conventional market actually served as crystallisation points igniting dynamics in food markets that helped establish organic products as real alternatives and integral parts of assortments, and not just niche products. Nonetheless, retail sale shares remain in single digit ranges in many countries and organic products **increasingly compete** with alternative “sustainable” (e.g. agro-ecological in France), or regional/local and traditional (e.g. Italy) product lines for the attention of conscious consumers as to really be considered mainstream in the food markets of these countries.

Considering the ambitious national targets until 2030, a large number of new professionals will need to engage in education of and advice for many more future organic farmers as well as in awareness raising of consumers. Numerous countries, like Italy, Hungary or Romania, however, do not have **Knowledge and Innovation systems (AKIS)** in place that are fully supportive and comparable to those in other countries with much more matured and effective AKIS (esp. Denmark, but also Austria or Germany). Well-functioning AKIS manage to fully integrate organic farming into mainstream agricultural extension and advisory services while regularly granting substantive research and development funds to the theme. To a certain extent the private sector, especially certification organisations, plays an important role in countries with a less developed AKIS for organic. Moreover, numerous EU programmes are critical settings in which the AKIS for organic is further developing. Several regional or local clusters have developed around research or pilot projects, as seen in Hungary or Romania, and serve as important knowledge hubs helping to outbalance deficiencies of the AKIS for organic. Still, only in rare cases the thematic scope of the AKIS for organic extends beyond production themes and covers the full value chain. The key bottlenecks that underpin the pertaining deficiencies in the AKIS for organic are: i) insufficient collaboration among actors in organic AKIS, ii) insufficient financial resources, often resting in low political commitment, iii) insufficient transfer of research and innovation into practice or collaborative science-practice exchange, iv) lacking long-term vision in organic farming research, and v) insufficient specialized training and education options for both farmers and advisors.

5.2. Scaling organic aquaculture in the EU

Principally organic aquaculture is on the rise. Nonetheless, recent growth trends need to be seen with a certain caution, because of data inconsistency and gaps. Although the sector is still in its infancy, certain patterns could be revealed in the course of literature review and empirical substantiation by case studies, that suggest that a number of different constraining or supportive factors are at play in organic aquaculture development in EU countries. Foremost and similarly to agriculture, the development of the sector requires working on both the demand and supply side, and beyond just incentives-based approaches.

A niche market with high potential

Despite the impressive growth seen in some countries, organic aquaculture can be considered a niche market in the EU. The sector is strongly market driven. Organic fish products, however, do not attract consumption in ways known for vegetable or meat and demand and prices for organic aquaculture are insufficient as to drive more fish farmers to convert. High bureaucracy and costs of certification add to this list of hindering factors for market development because they impact directly on the price of products. The price difference in comparison to conventional fish products remains a central barrier for market development. Overall, consumer awareness and willingness to buy remains a key bottleneck further complicated by the multiplicity of and competition with other sustainability labels (e.g. ASC, MSC) that confuse conscious consumers as key target group for organic aquaculture products. In numerous countries, for instance, wild catch fish is considered principally more natural or healthier than fish from aquaculture. However, although consumer attitudes are a critical component of market development marketing strategies are not fully explored in all regions or with a focus on (dis-) advantageous features of certain products (e.g. processed vs. fresh fish, sea vs. fresh water fish). The limited accessibility to organic

products at all relevant points of sales for potential consumers is adding to this unfavourable situation.

Need for aquaculture-specific and political support

Organic aquaculture is not regulated under the same legislation framework as organic agriculture. Although many organic action plans for countries refer to aquaculture as an important subsector, the aquaculture specific provisions (e.g. in National Strategic Plans) often remain rather unspecific or highlight sustainability rather in the context of conventional practices. Ireland has a dedicated section on organic salmon and mussels and is a telling, but also exceptional, example for the role of policy as a key driving force behind making the sector more sustainable. While considerable EU level support exists for the general sector, e.g. under the EMFAF scheme, decisions are eventually shaped at regional levels. However, local governments oftentimes seem overwhelmed when it comes to organic aquaculture. Even in countries like Denmark with a very strong organic market, the national legislation goes strongly against organic aquaculture because of environmental concerns (e.g. marine fish produced in nets). The key question is whether and how certification of specific aquaculture systems would be helpful to address the matter. Eventually, factors are often interrelated suggesting the need for a holistic approach to organic aquaculture development. In this respect, significant gaps persist in terms of broad policy commitment and support at both the EU and Member States levels, including providing monetary incentives (e.g. eco-premiums for farmers and subsidized prices for consumers), regulatory simplifications, targeted marketing strategies, and well-equipped research funds to support technical solutions or better data sources as to address the pertaining data gaps and inconsistencies.

Context matters for aquaculture, too

The aquaculture sector is very heterogenous and as for agriculture, there are no blueprint solutions for all cases, because of country specific conditions and factors that only concern specific species, ecological regions or the specific phase of development that the country is in. Depending on the fish species, for instance, different enabling and limiting factors are concerned in line with different regions as well as production and market situations. This makes it difficult to prioritize next steps across countries or regions. Moreover, country differences in GDP and purchase power may in fact impact considerably on the willingness, or possibility, to buy. More research, with higher specificity, is needed, for instance, on the biology of species or how to reduce environmental impacts in line with EU regulation, while addressing multiple technical challenges in relation to production (at least for some species), such as organic juvenile breeding or organic feed (esp. for carnivorous species).

Organic inputs: a bottleneck for developing organic aquaculture

The unavailability of organic fish feed adequately designed for the nutritional needs of different species as well as the unavailability of organic certified juveniles hinder the development of the organic aquaculture in a way not seen in agriculture. There is a very limited number of adequate options to better match organic ingredients, amino acid and fatty acid profiles, as well as other essential nutrients, covering the dietary needs for the full organic production cycle. Alternative sources of protein to fishmeal and fish oil (e.g. insect meals, vegetable proteins, algae and yeasts) are still scarce and, in any case, cannot achieve a sufficiently high replacement rate (Mente et al., 2019). Additionally, amino acid supplementation is not allowed in organic fish feed

formulations, and alternative organic inputs are not available (e.g. non-GMO vitamin B2). In this regard, the European regulation is highly inconsistent because it allows a derogation for the integration of histidine in the formulation of organic feed for salmon farming, but not for other amino acids which other species would equally need. Taken in its full perspective, the sufficient supply of organic eggs and/or organic juveniles for on-growing in certified organic farms, is very ambitious and currently unrealistic (European Commisson, 2016; IFOAM, 2021; OrAqua, 2013). It appears that the further growth of organic aquaculture is prevented by insisting on the principle that the entire production cycle must be organic before major technical problems are solved

Cooperation across the value chain

Organic farming associations, farmers and their social norms play a generally critical role for organic aquaculture, because decisions are often taken at group level. Despite their standing in some countries, organic producer organisations were not powerful and successful enough to push organic aquaculture. To a certain extent this is related to the 'lower' standing of and distrust in organic aquaculture inside the broader organic movement and the fact that besides dedicated producers the sector also entails large industrial companies, which barely fulfil the organic principles. Adding to the situation, conventional farming associations are pushing proactively against organic production as to defend their own ways of producing.

6. Conclusions

In order to reach the F2F goals, many more actors need to enter organic farming: be it as farmers, advisors, trainers, inspectors or market actors and consumers. In the following and drawing on the key lessons learnt in the course of this synthesis, we explore broader strategies as well as specific policy measures that could help capitalize on the substantive growth potential in countries with currently small areas and little market development and to move organic agriculture and aquaculture out of niche markets.

Programmatic approach to organic

The synthesis supports the idea that it is seldom only one, or one very specific factor that spurs or prevents sector development, but rather multiple factors – together. The standard supply-push model applied in many European countries partly failed to adequately push the development of organic farming (Daugbjerg & Schvartzman, 2022) due to a disconnection between organic production and marketing. On the demand side, it may be key to 'activate' retailers as powerful actors in the value chain that support organic cooperatives in accessing the wholesale market as to capitalize on the increased market potential of organic products (e.g. organic mussels grew by 40% only in the last year). Considering the power imbalance in supply chains and limited sales opportunities and margins for farmers, working with short food supply chains and cooperatives for small businesses – as it is currently happening in France, Germany or Italy – may offer a valid approach particularly in countries such as Hungary and Romania, that rely mainly on export or where policy support is not strong. Such bottom-up approach requires the engagement of consumers and strong networks of organic farmers and associations. Better marketing of and campaigning for organic products is required and may well deserve EU support in its own right. On the supply side the availability of organic input as feed or seed, the high financial risks or lacking capacities are pertaining hurdles for conversion. There is also a need for a stronger AKIS for organic that allows farmers to acquire relevant skills and capacities, as well as for research and innovation to overcome technical barriers.

The seemingly trivial suggestion that it is always a combination of factors that matters for sector development gains complexity when adding that different combinations of factors are relevant depending on the phase of sector development (see also aspect: 'shadow of the future'). While in early phases selective or targeted interventions in certain pilot regions or clusters can be useful, coordination between multiple actors across the value chains and political realms (states, levels) becomes especially critical during the upscaling process. However, considering the 'igniting' role of triggering events, like food scandals, new market opportunities vis-à-vis new food or health trends (as seen during the pandemic), political will and concerted action for systematic changes may be easier to unfold during phases when 'windows of opportunity' are wide open.

Key recommendation: It is important to take a system perspective, as seen in numerous action plans, and to employ an active market-development strategy that combines a policy mix of instruments to increase both the supply of and demand for organic food products (Daugbjerg & Schvartzman, 2022). In a more programmatic approach, policy would also not only provide monetary incentives on both demand and supply side (e.g. eco-premiums or tax reductions for farmers or subsidized prices or permits for consumers), but also support regulatory simplifications, targeted marketing strategies, including through public procurement and innovative and effective

media campaigns. Moreover, well-equipped funds for research and dynamic stakeholder networks need to ensure the development of technical solutions and innovation inside a conducive collaborative environment. Digitalisation may become a key aspect in addressing numerous barriers in capacity and awareness building, coordination and marketing, or for reducing bureaucracy.

Context matters, but not only

There are no one size fit all solutions for all countries and regions and what drove sector development in countries like Germany or France already in the 1990s may not be relevant for the newcomers in organic sector development, like Romania, Bulgaria or Hungary. The high variance in political, economic, ecological and societal circumstances and historical trajectories translates into different driving or hindering forces, at least to a certain extent. One prominent aspect of relevance for the different developments of focus countries was their history as EU members, with a certain advantage for established members that benefitted from early linkage to the common market established already in 1993. Austria is an exceptional case also in that it highlights alternative pathways focused on developing the domestic market and production based on high consumer awareness (and purchase power) in combination with policy commitment. Another differentiating aspect for scaling up is whether a country builds on federalism or not. Federal countries – like Germany or Italy – seem to be facing more issues of coordination across sectors, and political administrations, which may impact educational and advisory structures (as in Italy).

Moreover, conversion is also often first seen in small and/or less intensive holdings and rather on pastures than cropland, correspondingly. In combination with the abundance of low-input systems this may unfold as an advantage spurring accelerated growth in newcomer countries with high potentials – like Romania – in the near future if problems of marketing and market access are overcome. Common frameworks like the F2F strategy or CAP play a critical role for streamlining efforts towards commonly shared goals across Member States. Yet, the high variability in organic support payments within and between Member States may lead to an imbalance of fair conditions in competitive markets. A pertaining bottleneck relevant just for very specific countries like Italy and several newcomers is the limitation of the existing AKIS to provide capacities for farmers willing to convert in sufficiently high enough numbers and quality as to avoid high drop-out rates. Eventually, the different levels and points of departure will also be important to consider when defining how the overall target of reaching 25% organic area across the EU is to be shared among Member States in feasible and fair ways. So far, the targets set by individual MS represent just under 20% by 2030 and a business-as-usual development including policies now being implemented may end up at around 16-20% by 2030.

Key recommendation: Despite the EU-wide target of achieving 25% organic, individual country targets should reflect the different points of departure of each of them; their relevance and capabilities. This may imply that a country like Ireland with a very low share of organic farming but with high capacities could aim for a 400% increase or more, which would result in only 7.5% of the Irish agricultural land being farmed organically. A country like Austria would reach 35% organic with a modest increase of around 30%.

Critical for reaching the EU target overall, however, are the developments in the six largest agricultural countries: Spain, Italy, Germany, France, Poland and Romania, which account for two thirds of the EU agricultural area and more than 50% of the overall organic farmland in the EU.

Especially in Poland and Romania, the potential for expansion is huge. However, a key bottleneck is their small-scale farm structures that imply working with many more actors than in countries with larger farms. Eventually countries will have to define their specific, yet different priority areas for implementation and support.

Scaling: A matter of capacities

Tripling the organic production area in the EU until 2030 implies that a very high number of farmers needs to convert in a rather short period of time. Numerous actors, and not just the conventional farmers or aquaculture producers willing to convert, need to grow their competencies, including staff in public administrations, extension services or educational and training institutions meant to support farmers in this conversion process. A pertaining bottleneck relevant for several countries with high growth potential is the limitation of the existing AKIS to provide capacities for farmers willing to convert in sufficiently high enough numbers and quality as to avoid high drop-out rates. Major steps are to be taken in numerous Member States to further develop or strengthen the AKIS to deliver on those expectations, such as to:

- Better organise actors in and collaboration on AKIS
- Scale funding and financial resources; linked to policy commitment
- Foster knowledge transfer and exchange
- Create long-term vision and support in organic farming research
- Implement organic curricula in research, advisory services, training and education
- Encourage institutional change, including the establishment of organic centres of excellence (competence centres) and better integration of organic within mainstream agricultural institutions

In addition to public education, private structures inside the farming community (e.g. associations) or certification bodies can play a critical role to accelerate capacity building, not least because of their potential to develop close connections to local actors and across all regions. Research and innovation will also be important for addressing multiple technical challenges in relation to organic aquaculture production (at least for some species), such as organic juvenile breeding or organic feed (esp. for carnivorous species). Accurate and consistent information and its dissemination (e.g. from producers to consumers) is key for market development.

Key recommendation: A better functioning and structured AKIS, supported by institutionalised funding for research, advisory services and education, is required to ensure effective knowledge flow. This is especially true considering the extra efforts, including on digitalisation, needed for capacity building 'at scale' as for filling persistent knowledge and data gaps, for instance, in organic aquaculture.

The long and blurry shadow of the future

Scaling organic agriculture is no 'simple' rocket launch. It is impossible to gain and further accelerate speed with just one initial spark. The process from idea and technological innovation, over piloting and niche development to full maturity is not a straightforward set of steps, but implies a transformation of a full and complex multidimensional and multi-level system. Indeed, factors

that drive or hinder progress at ignition phases may no longer be relevant or insufficient for scaling later. Also, times and circumstances are changing. Back in the 1980s organic farming was gaining ground as practice in clear opposition to established (conventional) practices. Nowadays, organic agriculture has come under increased pressure to defend its values against various supposed "sustainability trends" in conventional farming and the general agri-food sector. On the one hand, emerging claims, and respective labels or communication initiatives around certain food qualities (e.g. 'traditional food', 'regenerative agriculture') risk being misused for greenwashing attempts. On the other hand, unprecedented systemic disruptions, like the recent pandemic or energy crisis make planning for future development more difficult, while holding considerable implications for sector development. It still needs to be seen how increasing speculations with land and agricultural produce interfere with the growth of organic production and sales.

Key recommendation: At individual farm level research is key to develop and test approaches to reducing risk perception or increasing economic feasibility. In light of the system-wide challenges and uncertainties of the future, more "system redesign" and adaptive management practices would not only be important in research and extension services to enhance natural processes and lead to more diversified production systems at farm level (Lamine, 2011), but also in food markets and policy to foster the overall resilience of the system.

Fostering alliances and the unique selling point of organic

The green marketing in conventional agriculture highlighting supposedly more sustainable, regional or traditional approaches has become a major challenge for organic to stand out. While conventional farming scandals have received less scrutiny lately, comparably higher attention was on organic farming fraud in production, processing or marketing (Mueller, 2023). However, drawing on the principle of 'polluter pays' and that the internalisation of external costs is an exceptional and distinguishing feature of organic (Zerger et al. 2005), the sector may be well advised to highlight its 'unique selling points' more proactively. Across the board, organic agriculture sets high quality standards for both production and processing that deliver on a range of ecological benefits, including on biodiversity and climate. For example, organic agriculture reduces energy use by 50% and GHG emissions by 30% on average by simply avoiding the use of synthetic N-fertilisers (Lampkin & Padel, 2022). From such a perspective the main challenge remains to assure that consumers become aware of the multiple benefits of organic agriculture and aquaculture. Beyond peers, alliances with non-agricultural civil society or public actors engaging in public procurement or environmental campaigning may significantly contribute to heightened societal acceptance of organic farming. Additionally, embedding organic in overarching policy fields more proactively, such as health, economy or environment, may assure that organic farming is gaining higher political priority and legitimacy; and appears less compartmentalized (Zerger et al., 2005). Overall, communication should point to the well consolidated evidence that organic is not only more environmentally friendly but can also be more profitable. Organic farming systems deliver food of equal or higher nutritious value with less (or no) pesticide residues than conventional practices and contribute to greater ecosystem services and social benefits (Reganold & Wachter, 2016). This directly relates to how the sector addresses and exchanges with consumers.

Although market demand for organic aquaculture, for instance, is expected to grow due to increasing consumers environmental and health concerns, aquaculture remains a sub-sector with

very high sensitivity to changing market conditions, such as input cost fluctuations or changing market demand. The potential of scaling up may be *per se* limited for organic production (at least in the same aquatic area). However, better marketing of and campaigning for organic aquaculture products is required and may well deserve EU support and finance (e.g. subsidies for farmers). Marketing strategies need to be adapted and combined with targeted communication channels (e.g. internet and social media) as to inform consumers transparently about organic aquaculture practices to spark demand and willingness to buy. This is linked, however, to concerted efforts that make organic products more generally, and organic fish products specifically, available at points of sale that are accessible for all potential consumers (e.g. supermarkets, large fishmongers, organic food stores). This will not work without supportive retailing or direct marketing structures in all regions and supportive policies.

Considering the complexity of value chains, effective **communication, collaboration and trust-building** between organic farming associations with their conventional counterparts as within the organic farming community will be critical. Neither the power imbalance (e.g. with retailers) nor different value systems may stand in the way of building trustful and collaborative exchange (Kottila & Rönni, 2008).

Key recommendation: A **differentiated communication strategy** has to be adapted for different farming styles, that highlights the advantages of organic and the distinct management approach as a basis for new alliances and trust-building, rather than relying mainly on criticising conventional, which evokes rejection by conventional farmers (Padel, 2001). Capitalising on neighbourhood effects, targeted support can exert a significant effect for expansion by building on established organic structures at the local or regional level.

Strengthening policy commitment to the organic idea

In conclusion and seeing the diverse constraining factors, but also concrete avenues to overcome them for further developing the organic agricultural and aquaculture sector beyond niches, stronger political will and efforts both at the EU and national levels will be essential to spark the systemic transformation. Although a critical factor, financial support focused only on supply side and area-based interventions seems limited as to achieve the Farm-to-Fork strategy's targets for organic. The experience from the past offers strong arguments in favour of the importance of political vision that is translated into action. In this respect, the multiple functions that organic farming fulfil for society beyond just providing marketable food need to be acknowledged politically. The environmental goods and services that organic offers help addressing many of the most pressing issues including climate change and biodiversity loss. Those additional values are hardly represented in value chains and market prices alone; whereas reliance on market forces also provokes general concerns about fairness and as to whether customers of organic products are to bear the full costs of services that benefit the entire society. The state may take on a much more proactive role in not only supporting actors that already provide for public goods, but also in encouraging many more actors to convert to organic land use.

Key recommendation: The target of 25% of organic farmland in Europe requires reforms, political will and actions across the board: from political and legal reforms that simplify regulation, to an increase of agricultural budgets dedicated to organic practices beyond mere area support and including AKIS, public procurement, marketing, awareness raising, and innovative campaigning to foster demand.

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8. Annexes

Table 43. Organic subsidy programmes in Italy 1994-2020 with payment rates differentiated by land use

Organic support scheme	*Million EUR (spent)*	*% organic/ total of agr-environmental measures*
Measure A3/A4 - - 2078/92 (1994-1999)	n.a.	36%
Measure F (2000-2006)	n.a.	37%
Measure 214 - organic (2007-2013)	1 590.6	42%
Measure 11 (2014-2020)	1 404.4	33%

	2014/2020 - Measure 11 (Euro/ha/year)				**2007/2013 - Measure 2.1.4** (Euro/ha/year)			
	Conversion		Maintenance		Conversion		Maintenance	
Production type	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Arable crops	145	650	120	600	105	600	90	600
Forages	100	450	90	359	80	450	80	450
Pasture	13	550	60	450	54	208	54	208
Vegetables	463	1 200	328	1 000	247	921	147	737
Grapes	506	1 200	465	900	495	900	400	900
Olives	390	900	330	810	335	680	270	630
Permanent crops (other)	640	1 200	520	900	234	900	207	900
	2000/2006 - Measure F (Euro/ha/year)				**1994/1999 - Measure A1+A2** (ECU/ha/year)			
	Conversion		Maintenance		Conversion		Maintenance	
Production type	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Arable crops	101	650	101	530	145-193	181-302	145-193	181-301
Forages	110	650	110	650	121	302	121	302
Pasture	60	450	50	450				
Vegetables	250	650	241	650				
Grapes	615	960	492	964	386	845	386	845
Olives	390	950	298	900	223	483	223	483
Permanent crops (other)	700	950	550	900	386	845	386	845

Source: Abitabile, 2010 ; De Leo, 2020 ; Vaccaro & Viganò, 2015 ; Vagnozzi e Giarè, 2000.

Table 44. Organic subsidy programmes in Hungary 2004-2021, differentiated by land use[37]

Operators				Area			
2004-2008	2009-2014	2015-2019	2021	2004-2008	2009-2014	2015-2019	2021
1’071	1’197	3’152	5’129	6’5743	81’107	192’412	293’597
Conversion subsidies (EUR/ha) in years				**Maintenance subsidies (EUR/ha) in years**			
2004-2008	2009-2014	2015-2019	2022+	2004-2008	2009-2014	2015-2019	2022+
Arable land							
--	186.5	242	458	--	186.5	172	349
Vegetables							
--	186.5	516	1’097	--	186.5	366	664
Permanent crops (orchard)							
--	692.8	1’040	1’840	--	692.8	802	1’136
Grape							
--	692.8	873	1’132	--	692.8	6’749	1’097
Other							
--	692.8	7’341	1’762	--	692.8	568	967
Grassland with animals							
--	105	147	204	--	105	147	204
Grassland without animals							
--	105	84	--	--	105	84	--

Source: Prime Minister’s Office, 2020, Eurostat.

[37] Data incomplete for 2020-21.

ORGANIC TARGETS 4EU

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CIHEAM BARI

Fondazione COISPA ETS

consulai

FiBL

FiBL Europe

Innovation Centre for Organic Farming

IDDRI SUSTAINABLE DEVELOPMENT & INTERNATIONAL RELATIONS

ICROFS International Centre for Research in Organic Food Systems

INRAE

itab l'Institut de l'agriculture et de l'alimentation biologiques

Landwirtschaftskammer Niederösterreich

Landwirtschaftskammer Österreich

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