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The EU farming employment: current challenges and future prospects

Agriculture and Rural Development

Policy Department for Structural and Cohesion Policies
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RESEARCH FOR AGRI COMMITTEE

The EU farming employment: current challenges and future prospects

Abstract

This study outlines the current trends and patterns of farming employment in the EU and discusses possible development paths for the European agricultural labour force.

In particular, this study investigates the drivers of and structural changes within agricultural labour markets at regional, national and EU level, building on a range of quantitative and qualitative analysis methods.

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LIST OF ABBREVIATIONS

AGRI	European Parliament's Committee on Agriculture and Rural Development
AI	Artificial Intelligence
AWU	Annual Working Unit
CAP	Common Agricultural Policy
CMEF	Common Monitoring and Evaluation Framework (European Commission)
EAFRD	European Agricultural Fund for Rural Development
EP	European Parliament
ERDF	European Regional Development Fund
ESD	European social dialogue
ESF	European Social Fund
EU	European Union
EUROSTAT	European Statistical Office
GDP	Gross Domestic Product
GVA	Gross Value Added
MS	Member State
NUTS	Nomenclature of Territorial Units for Statistics
OGA	Other Gainful Activities
OP	Operational Programme
RDP	Rural Developmment Programme
RIS3	Research and Innovation Strategies for Smart Specialisation
UAA	Utilised Agricultural Area

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EXECUTIVE SUMMARY

Subject matter

This study on *"EU farming employment: current challenges and future prospects"* examines the current structure of and latest trends in EU farming employment, exploring in particular the drivers of agricultural labour markets and how they differ across Europe. Starting from an analysis of the historic and spatial patterns of changes within agricultural holdings and the labour force in Europe, the study then delves into the determinants and effects of such developments, the associated challenges and the microeconomic strategies implemented to overcome them. The role and performance of the CAP, as well as other national and regional institutional frameworks, with regard to maintaining agricultural employment and improving farmers' working conditions in rural areas is discussed, building on a comprehensive literature review and in-depth case studies.

Main findings

As a whole, farming employment in the EU has been steadily declining for decades and has fallen from 13.1 million Annual Work Units in 2003 to 9.1 million Annual Work Units in 2018 across the EU-27, representing an **impressive 30% decrease in the last fifteen years.** Concurrently, the number of small and medium-sized farms has diminished, while the number of large farms (above 100 hectares) has risen, hinting to a consolidation of the farming sector. The **picture is however not uniform across the EU,** with a few Member States having recently experienced a modest increase in the number of farms (Czech Republic, Slovakia) and others in their agricultural labour force (Greece, Slovenia, Malta and to a lesser extent, Cyprus, Romania and Lithuania). When looking at this trend from a regional perspective, some additional regions dispersed across Europe are standing out with an even stronger increase in farm labour force (Corsica, Eastern Wales, Alentejo, etc.).

Likewise, there is no clear-cut West-East or North-South divide of farming models in the EU: many parts of Europe predominantly feature **family farming models** (Ireland and Northern Ireland, the Central European area (encompassing Bavaria, Austria, Northern Italy, Slovenia and Croatia), the Atlantic coastal regions (from Northern Portugal to Northern Spain), as well as Romania, Greece, Poland and Latvia), while other regions demonstrate a majority of **externally hired labour** (the belt ranging from Eastern-Germany to Slovakia over Czechia, the majority of France and Southern Spain). In addition, relying on **temporary labour** is not a unique practice of Mediterranean agriculture but is also found across Europe including in Flanders, the Netherlands and Western Germany.

These disparities, vailed behind an evident concentration of the agricultural economy at the European level, raise the question of the determinants of structural changes within agricultural holdings and how they affect employment. What are the various **drivers of structural changes** within European farms, and how does this relate to family and/or corporate farming models? To what extent are structural changes bringing about **challenges and opportunities** for local farmers? What **microeconomic responses** are to be observed across Europe? Finally, what are the **future prospects of farming employment** at different territorial levels? Through a combination of quantitative and qualitative analysis methods, this study offers a range of evidence-based findings to respond to these questions and suggests substantiated recommendations for policy action at the EU level.

The **regional case studies** carried out as part of this study provide detailed insights into the challenges faced by European farmers, and more generally the agricultural sector, taking the lens of the regional level. The **quality of life in rural areas** for farmers and their families, the **ageing** of the farm managers' population, the **urban-rural income gap** and ensuing *"brain drain"* of young educated workers

towards more vibrant economies, the difficult **access to credit** and lack of targeted investment, the **shortage of labour supply** during season peaks and the employment of **migrant workers** to meet this need, and the adverse and potentially sizeable effects of climate change on agriculture have been recurrently mentioned as challenges for the regional agricultural sectors researched. Additionally, some regions suffer from a **deficient land cadastre,** impeding farm transfers outside the family circle, while other show a persistent **technological and innovation laggardness** with family farms unable to remain competitive.

In order to reduce their dependence on a single source of income, increase their revenues and thereby ensure the viability of their holdings, farmers can undertake different activities, both on and off-farm. These include on-**farm diversification activities** (such as processing and/or selling of agricultural products in short food supply chains, agritourism and renewable energy production) as well as off-farm, **non-agriculture-related gainful activities.** However, at the EU level, these two **options remain limited,** as only 1 in 20 farms were diversified across the EU (with wide disparities between evident countries)[1] and the majority of farm managers still dedicate all of their time to farming in many EU countries[2]. Difficult access to land, unfavourable weather conditions, low tourism potential and the relative isolation of some rural areas are all obstacles to the further expansion of farm diversification.

The application of **statistical forecasting models** allows for the short-term evolution of farming employment related variables to be estimated and future values to be predicted, within a range of likely values (confidence intervals) mirroring the uncertainty linked to future policy interventions and other external influencing factors. More specifically, the forecasting model has yielded the following results: **further contraction of farming employment is expected** at the European level, in line with the European Commission's agricultural outlook for 2030. More importantly, **generational renewal** in the agricultural sector is likely to remain an issue of concern in the business-as-usual scenario, as the number of farms managed by young farmers – already significantly lower than that of older farmers – is following a steep downward path.

The **impact of the CAP** on agricultural and rural jobs, as so far reported by different evaluations performed across Europe, is **mixed.** The schemes and measures implemented through the first and second Pillars of the CAP (namely the direct payments and rural development measures, respectively) have produced diverse, sometimes opposite effects on the farming labour force, depending on the nature and scale of the investments, the use of the payments by farm managers (e.g. hiring additional workers or substituting mechanised for human labour), the farming systems in place locally as well as other influencing factors such as synergistic or competing sectoral, fiscal, social and environmental policies stemming from different governance levels (including measures funded through the European Regional Development Fund and European Social Fund). The upcoming CAP programming period, and in particular the types of Pillar 1 schemes (and rules governing them) as well as the objectives of Pillar 2 measures (and their weight in the RDPs), will be key in supporting change in a shrinking farming sector over the years to come.

[1] Source: European Parliament Research Service, *Farm diversification in the EU*, Briefing, April 2016, data from 2013.
[2] Source: Eurostat, data from 2013.

Policy recommendations

In order to curb some of the main issues identified, the 2021-2027 CAP could be pay greater attention to:

- Increasing efforts to keep young generations within the sector and encourage **new entrants** to take up or set up farming businesses.
- Improving the **quality of rural employment** by investing in diversification and added value to farming, in line with the "greening" and sustainability strategies.
- **Tailoring rural development support** to the needs and potential of the region/country, focusing namely on rural values and rural fabric (CAP *"rooted"* in the territory).
- Offering **more flexibility to fine-tune CAP Pillar 1** to meet regional needs, and in particular stimulating more agricultural production where production is scant through coupling, so as to incentivise older farmers to retire and hand over their holding and/or land to younger farmers.
- **Streamlining the two pillars of the CAP at the territorial level** so as to achieve a common vision and clear objectives with regard to farming employment; and
- **Better integrating and coordinating the CAP goals and tools with EU social policies** and other European Structural and Investment Funds, especially in respect of the migrant workforce – a potential solution to rural depopulation.

1. AIM AND APPROACH

This report stems from a study on *"The EU farming employment: current challenges and future prospects"*, commissioned by the European Parliament's Committee for Agriculture and Rural Development.

The overall aim of the study is to provide an overview of the current structure of the agricultural labour force and analyse the main determinants of its future evolution, covering in particular:

(1) Current and future trends in EU agricultural employment and their interactions with farm structural changes.
(2) Determinants to leave the EU agricultural sector, in particular within family holdings.
(3) Main microeconomic pathways/labour responses to meet structural changes in agricultural markets.
(4) Roles of pluriactivity, off-farm employment and migrant workers in supporting farms' viability.
(5) Role of institutional frameworks, including the CAP, in EU agricultural employment; and
(6) Possible contributions of agricultural policies to EU initiatives such as the European social dialogue, the EU Social Pillar, the "Europe 2020 Strategy on Growth and Jobs" and recent migration commitments (Marrakech declaration).

Policy recommendations focus on how the CAP and/or other EU policies can help to improve the functioning of agricultural labour markets and accompany future restructuring.

This report (hereinafter referred to as "study") sets out the study findings, beginning with a brief overview of the topic (in this introduction), followed by a more **extensive literature review** which identifies and discusses the findings of previous research on the evolution and the drivers of agricultural labour markets in the EU, and the role of the CAP in that domain (Section 2). The **analysis of labour markets** based on current data and models is laid out in Section 3. Section 4 then presents the findings from contrasting regional **case studies,** which have enabled a more in-depth examination of some of the main trends and issues explored in Sections 2 and 3. Section 5 draws together the findings from all of the elements of the research into a **synthesis** and develops **conclusions and recommendations.** The study **methodology** is explained in more detail in the Annex A and the **background data for case studies** is developed in the Annex B.

Study context: a brief overview of EU farm employment

General trends and key distinctions across the EU

As European economies have developed, the general pattern has followed a **reduction in labour in agriculture** and increases in that of other sectors, both in absolute and relative terms. From 1973 to 2018, the number of persons employed in farming in the EU-15 fell dramatically from 7.6 to 4.8 million Annual Work Units[3]. Similarly, as the EEC – EU has grown, and more territory has subsumed within the single European market, there has been an increase in the pressure upon countries and regions to free up land markets and enable structural change and modernisation in agriculture, to be competitive with their best-performing neighbours. From 2003 to 2018, the farm labour force in the EU-27 fell from 13.1 to 9.1 million AWU (European Commission, 2019). However, this general trend masks **significant differences in the scale, pace and patterns of change** at national and regional levels, influenced by geography and related farm structures, legal and institutional frameworks, and economic developments within and beyond agriculture.

[3] Source: Eurostat.

The **nature of farm work** has changed significantly in many places, as machinery and technology have replaced manual labour input or shifted the balance of activities on farms. A general trend has been a diminishing share of work devoted to manual tasks and more prevalent management and business/accounting processes; while the proportion of farmers with businesses that have diversified to rely upon multiple income streams, has grown. Trends in respect of **full-time versus part-time work** have not been consistent – in some regions and some sectors there has been an increasing dominance of farming by full-time enterprises while in others, part-time farming is significant and persistent. In some instances, part-time farming has grown as more flexible off-farm rural employment options have emerged.

Farm employment is influenced by a wide variety of **policy and non-policy factors.** In EU policy there is a stated commitment to the *"European Model of Agriculture"*[4], promoting a vision of territories occupied by medium-scale, family-run businesses using their own initiative to produce high added-value products for the EU and the international market place. Nevertheless there has been a trend in many Member States for farms to *"incorporate"* in order to ease the process of securing capital for growth and development, and/or facilitate inter-generational transfer. The working relationships and responsibilities of people working on farms thereby evolve with these structural trends, and in some cases the **corporate model of land holding and management** leads to a situation where farmers effectively become workers in a vertical supply chain, following corporate production methods largely dictated by processors or retailers.

At the other end of the spectrum, there remain important parts of the EU where farm structures are very small and production has a **semi-subsistence** character. In some regions this is a persistent feature, while in others it is a circumstance that has re-established itself following economic crises affecting other sectors. In other regions yet, rural areas have seen **enlargement and specialisation** on such a scale that very few farmers manage vast swathes of land, resulting in their contribution to rural communities and economies being diminished.

Traditionally, most individuals registered as *"principal farmers"* in the EU have been men. However, this masks significant **involvement of women in agriculture,** as informal and formal partners in business more often than the titular head of the holding. In some countries women have played an important role promoting farm diversification and added value while in others they have become prominent as male labour was drawn away from the land by economic development. Some countries such as Finland specifically encourage female entrants into agriculture through fiscal provisions, while in others women's contribution is undervalued or under-recognised.

Pluriactivity[5] **and diversification**[6] change the drivers and characteristics of farm employment. Sometimes, the limited incomes from farming push farmers and their families to look for other income sources, which frequently means off-farm employment which can place farming in a subordinate position (e.g. farms managed in evenings and at weekends). In other cases, diversification is a business strategy to increase resilience, so the hours on the farm may not be reduced but new employment opportunities are created through the diversified enterprise(s) which enable more people to earn a living from working "on the farm", even if some don't engage in agricultural production.

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4 Formalised since 1997 at EU level (European Council of 14-15 December 1997, Luxembourg, point 40), https://www.europarl.europa.eu/summits/lux1_en.htm

5 Pluriactivity refers to on- or off-farm activities other than and in addition to farm work (in most cases) for remuneration (source: European Parliament Research Service (2016)).

6 Diversification refers to on-farm gainful activities other than farm work but "directly related to the holding or having an economic impact on the holding" (source: European Parliament Research Service (2016)).

The **choice of farm outputs and business strategies** will also have an important influence upon the nature and needs of farm employment. For example, family-sized dairy farms impose one of the heaviest and continuous labour loads whereas large-scale arable farming involves periods when labour requirements are minimal and other times when they are very heavy (e.g. pre-sowing/planting, and harvest). Some farms have big peaks and troughs in labour demand which encourage the use of external contractors or seasonal workers (e.g. fruits- and vegetables-picking). Currently some farm sectors and regions depend heavily upon migrant workers, and social conditions have been a cause of some concern.

Current concerns

Generational renewal in agriculture is a concern for many Member States and one that is shared internationally. Successful transfer of farms between family members can be problematic due to a complex mix of personal, social and cultural reasons, as well as fiscal and financial disincentives and structural and legal constraints. Land market immobility, poor access to credit, persisting income gaps between the primary and the other economic sectors and a lack of proper provision for managing the transfer process ensuring a respect of the older generation can all deter generational renewal, with negative impacts on sustaining farm employment into the future.

Globalisation continues to encourage the European agricultural economy to improve its **competitiveness and labour productivity,** spurred by significant differences in living standards and costs, and therefore wages, across continents.

Climate change and its multiple impacts on agriculture (droughts and fires, flooding or other extreme weather events, shrinking biodiversity, etc.), as well as significant health and safety hazards also affect farm labour force trends.

The **economic and budgetary crisis** that hit Europe in the wake of the financial crisis in the US circa 2008-2010 has caused long-term adverse effects on the agricultural economy. Persistent and reduced demand for commodities, lower prices of agricultural products and lower availability of credit and investment options pose continuing challenges for EU farmers. At the same time, the crisis has pushed some people to return to farming, *agriculture acting as a "shelter" sector* due to its counter cyclical nature.

The European Commission's proposed budget for the CAP in the **next Multiannual Financial Framework (2021-2027)** amounts to €365 billion, which is a significant reduction on the current programming period (2014-2020) amount of € 408 billion, also representing a challenge to continued employment in EU agriculture. Compared to the total EU-27 2014-2020 envelope, the proposed CAP allocation implies a reduction by 3% in current prices and 15% in constant prices (European Parliament, 2018).

The role of the CAP

Economic theory suggests that, when policymakers intervene in markets to provide additional resources or improve economic conditions for a particular sector, the sector is likely to attract and retain more resources than it would have without the policy. In this regard the CAP, operating with objectives to stabilize prices and/or to support farm incomes, may have encouraged the **retention of labour in farming** which might otherwise have left the sector. However today's CAP consists of a variety of

instruments pursuing more diverse goals, reflecting its multifunctional model[7]. The future CAP after 2020 is planned to have specific objectives to ensure viable farm income and to promote jobs and growth in rural areas[8]. In the current CAP, decoupled support under **Pillar 1** provides income support and stability to farming businesses, so may encourage the retention of farm labour. **Pillar 2** includes aid for agricultural investment to improve its productivity and profitability, as well as compensatory support for disadvantaged territories to counter land abandonment, and aids for the wider rural economy, each with different impacts on farm employment. As the aids differ in relative scale and priority between Member States and regions, the **CAP could thus affect farm employment very differently** across EU territories, affected by the dynamic interplay of socio-economic factors, including policy performance.

Over time, the CAP's focus has gradually shifted from its early goals focused on increasing output and productivity, through supply controls and then the design and launch of the two-pillar CAP and decoupling. The CAP has enabled an increasing **diversity of national and/or regional approaches** to addressing its current goals of competitiveness, sustainability and rural quality of life. Some Member States wish to maintain their farm employment, while others favour shrinkage. Further, some target farm jobs territorially, by age or by sectors with high environmental and/or cultural value. These choices affect the types, qualities and norms of farm employment.

An exploration of how the CAP, working alongside other national and regional frameworks, could enhance the quantity and/or quality of EU farm employment in the pursuit of its broader goals, is therefore a relevant focus for policy makers in the Parliament and the Council.

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7 See Point 40 of the conclusions of the European Council of 12 and 13 December 1997, Luxemburg, available at: www.europarl.europa.eu/summits/lux1_en.htm

8 For more information, see the European Commission's Brief 1, *CAP specific objectives explained – Ensuring viable farming income*, available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/cap_specific_objectives_-_brief_1_-_ensuring_viable_farm_income.pdf
and the European Commission's Brief 8, *CAP specific objectives explained – Jobs and growth in rural areas*, available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/cap-specific-objectives-brief-8-jobs-and-growth-in-rural-areas_en.pdf

2. EU LEVEL RESEARCH: LITERATURE REVIEW

KEY FINDINGS

- During the course of the 19th century, the structure of the agricultural labour market changed significantly due to a variety of factors such as increased labour productivity from mechanization and innovation, structural change due to economic transition and modified demographic patterns in rural areas (e.g. foreign labour, generational and gender gaps).
- One of the stated objectives of the CAP is maintaining agricultural and rural jobs. However, the impact of the CAP is highly heterogeneous across EU MS and regions, varying both in terms of net effect (positive or negative impact) and in the costs of maintaining or creating jobs in the primary sector.
- The complementarities and synergies between the CAP and other EU initiatives supporting environmental protection, social security and inclusion are still understudied issues, but can lead to improved efficiency in achieving policy and strategic goals.

The functioning of the agricultural labour market in the EU has been the subject of a variety of studies conducted by academic experts, consultants and practitioners. A number of European research projects have also addressed EU farming employment, such as the FP7 projects FACTOR MARKETS (Tocco et al. 2012; 2013a; 2013b; Swinnen, 2013) and CAP-IRE (Viaggi, 2011), and more recently the H2020 projects SUFISA[9] and SUREFARM[10]. This has resulted in a large range of literature, encompassing both scientific articles published in peer-reviewed international journals and publications in the *"grey literature"* (e.g. reports, on-line blogs, policy briefs).

The objective of this section is to provide an **overview of the issues surrounding the EU agricultural labour market** by means of literature review and desk analysis. In particular, it has three main objectives, reflected in the following three sub-sections of this section:

(a) identify the issues and drivers surrounding agricultural employment in the EU;
(b) identify the role of the Common Agricultural Policy (CAP) with respect to agricultural employment in the EU; and
(c) identify the relationship between EU policies and other EU initiatives, in particular social initiatives, and the potential implications of such initiatives for agricultural employment.

These findings are applied to inform the analyses presented in Sections 2 and 3.

9 https://www.sufisa.eu/
10 https://surefarmproject.eu/

2.1. EU-wide literature review: the changing nature of EU farming employment

2.1.1. Introduction

This sub-section identifies the main issues – including the facilitating and hindering factors as well as the **structural characteristics –** of EU farming employment and the **trends** over time, through a desk-based comprehensive literature review of both the academic and grey literature. In particular, the analysis focuses on **four main aspects:**

(a) The determinants of EU agricultural labour markets.
(b) The drivers of change in EU farming employment and future prospects.
(c) The drivers of structural change of EU farms.
(d) The use of different employment types (seasonal/permanent, pluri-activity, etc.).

The results concerning the first three points are presented and discussed in sub-section 1.2; while the use of different employment types in the EU agriculture is presented and discussed in sub-section 1.3.

2.1.2. Determinants and drivers of EU agricultural labour markets and structural changes

Agriculture remains a major sector for employment in the EU, employing approximately 9.7 million workers and accounting for almost 4% of total employment in the EU in 2016 (Eurostat, 2018). **Agricultural employment** as a share of total employment is higher in some of the Member States (MS) than in others. In particular, in Romania the agricultural sector employs 23% of the workforce; in Bulgaria 17.5%; in Greece 10.7%; and in Poland 10% (Eurostat, 2018).

Across the EU, over the period 2007 to 2017, approximately 2.5 million workers left the agricultural sector resulting in a total **decline in the number of agricultural workers** from 11.5 million in 2007 to 9 million in 2017. Dries et al. (2012) found that between 1990 to 2005 an average of 11% of agricultural jobs were created but at the same time 14% of agricultural jobs were lost, resulting in a net agriculture labour outflow of about three percentage points over the period. The MS who joined the EU after 2004 witnessed a larger loss of agricultural workers, with agricultural employment decreasing by 1.7 million workers during the period 1990-2005.

Such labour outflow is heavily driven by significant structural changes in the sector, mainly in terms of a declining number of farms, combined with increasing attempts to pursue economies of scale through higher farm size and investments in machinery and technology (EC, 2017: 65; 2018: 80-81). In other words, **structural change is moving towards a concentration of EU agricultural activity** in a decreasing number of larger capital-intensive farms. Structural change itself, however, can be caused by a number of factors. The main factors identified are: i) **technological progress;** ii) **accession to the EU;** iii) **income gap** between alternative economic sectors (see also Matthews, 2019); iv) age and education; v) gender gap.

(a) Technological progress

The widespread and intensive industrial and technological growth in Europe since the 1950s had a fundamental influence on the agricultural labour market structure (Edan et al., 2009; Gallardo and Sauer, 2018). Technological innovation is a key factor for improving agricultural productivity and maximizing food supply through higher yields, but technological progress also increases the **productivity of agricultural labour** (i.e. the same yield can be obtained using less labour). As a result,

technological progress tends to be associated with a lower demand for labour in general, concurrently with a higher demand for specialised and skilled labour (Pesce et al., 2019: 55).

The process of substitution between human and mechanized labour has seen a change over the last 15 years with the introduction of **digitized agricultural technologies** (Marinoudi et al., 2019). Traditionally, agricultural mechanization concerned standardized and repetitive tasks, such as ploughing and combine harvesting, which triggered the substitution between humans and machines. Nowadays, the introduction of robots and artificial intelligence (AI) allows for the automation also of non-standardised tasks (e.g. fruit picking, selective weeding, crop sensing) previously reserved for human workers (Marinoudi et al., 2019). However, there are many jobs in the agriculture labour market which are complex and characterized by unpredictable and heterogeneous environments, in which humans play an essential and non-replaceable role. For these jobs there is complementarity between humans and machines rather than substitution. This complementarity occurs through the implementation of machine learning approaches on various cognitive tasks, such as yield prediction, disease detection and soil conditions identification (Marinoudi et al., 2019). As a result, while a number of manual and repetitive tasks could be entirely replaced by automation, the skilled and cognitive agricultural jobs might increase and be augmented with AI. On the other hand, Lampridi et al. (2019) suggest that the economic gains of robotic farming systems compared to conventional agricultural machinery systems remains questionable. Their analysis indicates that the cost of robotic systems in arable farming is higher than conventional machinery systems.

Looking at recent trends of substitution and complementarities between human and mechanical labour, the EU agricultural outlook of the European Commission (2018) predicts that labour outflow from the agricultural sector will continue until 2030, albeit at a slower pace than previously. The outlook suggests that the **agricultural workforce will reach 7.7 million workers in 2030, with a yearly decline of 2% by 2030.** These predictions assume an increase in investments in agricultural technologies, such as precision farming and digital agriculture, combined with a period of low oil prices, which may also intensify agricultural investments (EC, 2018: 80-81). Devlin and Foundation (2016) argued that the technology-driven economic transition in the UK had huge impacts on changing farming practices and agricultural labour use. They predict that this trend will continue in the future as a result of the implementation of policies supporting the adoption of agricultural technologies and of trade strategies that will promote the export of low-labour-intensive commodities while, at the same time, increasing the import of high-labour-intensive commodities.

Currently, technology-intensive farming in the EU is associated with the introduction of digital innovations such as remote sensors (EC, 2017; 2018), robotic vehicles (Walter et al., 2017), automatic irrigation systems (Masseroni et al, 2018), and other smart farming technologies. The concentration of the farming sector due to increasing farm size combined with declining number of farms is also accelerating the adoption of technology-intensive farming practices in the EU, as larger farms are financially more able to adopt new technologies, reducing labour and inputs costs (EC, 2017; 2018; Knierim et al., 2018). The European Commission (2017: 68), however, anticipates that the current trend towards a technology-oriented agricultural sector will push labour costs upwards, as **farming will demand higher-skilled labour force.** These predictions are supported by the increasing number of trained farm managers seen in many MS. Approximately 20% of young farm managers (under 35 years old) in the EU have received agricultural training, compared to 5% of farm managers above 66 years old (EC, 2017:68). These statistics are in line with the data provided by Eurostat (2018), which show that in 2016 about **19% of young farmers had received full agricultural training** compared to 2.6% of farmers above 65 years of age. These statistics can help to explain the **increase in the number of medium- and large-size farms managed by young farmers** which reached 27.5% of EU farms, the

highest proportion compared to other age classes (Eurostat, 2018). Moreover, these statistics can also help to explain the increasing demand for skilled labour in the agricultural sector, as young farmers have more up-to-date agricultural education enabling the adoption of new and innovative farming practices. Finally, the European Commission report (2017: 66) predicts that the rate of uptake of agricultural technologies and innovation will be relatively higher in the new MS, suggesting higher rates of agricultural labour outflow due to rapid technical change, than in the other MS.

(b) Member States transition (EU accession)

In addition to technological progress, the economic growth driven by accession to the EU facilitated the expansion of the services and industrial sectors, creating **new employment opportunities** that affected the structure of the agricultural labour market in the new MS. This emerges clearly in the study by Tocco et al (2013a), which highlights the impact of transition on the economic structure of the new MS, in particular reducing the employment in the agricultural sector in favour of the industrial and services sectors.

Economic theory suggests that the labour markets of all sectors in the new MS during the pre-transition period were distorted, and inefficient allocation of labour was particularly affecting the agricultural sector. During the **transition period,** the agricultural sector played a buffering role by providing employment for the *"surplus"* workforce resulting from the abandonment of the industrial and services sectors (Brada, 1989; Jackman, 1994; Seeth et al. 1998; Bojnec and Dries, 2005). Bojnec and Dries (2005), for example, found that inflow of labour into the agricultural sector in Slovenia just after its accession to the EU was predominantly driven by a lack of alternative jobs opportunities in other sectors. This tendency reverted during the **post-transition period,** when increasing economic growth provided job opportunities in the industrial and services sectors at higher salaries than those in agricultural sectors. In this respect, the European Commission (2017: 66) predicts that labour migration from the agricultural sector will continue as long as the other sectors in the economy provide more attractive incomes. Labour outflow from rural areas is not only due to the rural-urban income gap, but also to the availability of better infrastructure and services in urban areas compared to rural ones (EC , 2017: 66), suggesting that improvement and development of the **infrastructure and services in rural areas should improve their attractiveness, resulting in a slowdown of workforce migration.**

(c) Income gap between alternative sectors

The **income gap between the agricultural and other sectors,** such as the industry and services sectors, is a major factor underlying labour outflow from rural areas. Gullstrand and Tezic (2008) stress that the wage and income gap between agriculture and other sectors, combined with **low agricultural education,** are the main factors influencing labour flow from agriculture to other sectors in Sweden. Tocco et al. (2013a) note that wage differentials between off-farm and on-farm activities decrease the potential for working in agriculture in rural regions of Hungary, Italy, France, and Poland. They found that regions with higher unemployment rates are more likely to have high agricultural employment rates, indicating that the **agricultural sector is able to attract labour when labour demand is low in other sectors.** In addition, Tocco et al. (2013a) suggest that a high agriculture employment rate is associated with low full-time agricultural employment in Hungary, Italy, France, and Poland, indicating that in these countries most agricultural workers are also involved in other off-farm activities. However, this is not the case in all MS, as **opportunities for off-farm jobs** might be limited in other countries, or the household income can be more specialized towards farming, rather than diversified across different activities. In Slovenia, for example, Bojnec and Dries (2005) suggest that a higher number of on-farm working hours is positively correlated with a high agriculture employment rate, but also with lower

education levels, which might indicate less potential for Slovenian farmers to access alternative off-farm jobs due to a lack of knowledge and/or transferable skills.

(d) Age and education

Data from Hungary, Italy, France, and Poland analysed by Tocco et al. (2013a) indicate that there is a higher probability (20-40%) of young workers (under 35 years old) being employed in non-agricultural sectors, compared to older workers (above 54 years old), who only have a 5-7% probability of working in a non-agricultural sector. In other words, older workers are more likely to work in the agricultural sector rather than younger ones. These findings are consistent with the overall demographic distribution of agricultural workforce in the EU, where about 20% of agricultural workers are above 54 years old. However, the **relationship between age and agricultural employment is not linear,** as the rate of people seeking occupation outside agriculture decreases with increasing age (Tocco et al., 2013a). For **age groups** greater than 54 years agricultural labour outflow starts to increase again, but this time due to retirement. Younger workers are more likely to have better education than older ones, which makes them more adaptive to occupational changes, and more flexible to occupational and location mobility. This does not concern only the countries considered by Tocco et al. (2013a) (Hungary, Italy, France, and Poland), but also Slovenia, where Bojnec and Dries (2005) find that young individuals are more likely to leave the agricultural sector for industrial or services jobs; and for each additional year above the age of 49 years the probability of finding a job in services or industry decreases by 10%. They also found that better educated workers have higher probability of getting employed in non-agricultural sectors, especially services (Bojnec and Dries, 2005). The strong linkages between lower education levels and employment in agriculture are recurrent in the literature, whereas higher education is negatively correlated with agricultural employment. This is usually explained by the fact that farming provides income and employment to low-skilled labour, and the skilled and highly educated workers perceive agriculture as less attractive than the industrial and services sectors (Tocco et al., 2013a).

(e) Gender gap

The agricultural labour market remains unbalanced in terms of gender employment. Tocco et al. (2013a) suggest that men are more likely to work in agriculture than women, although they are also more likely to leave the agricultural sector to work elsewhere. Only in Italy are men less likely to leave the agricultural sector in comparison to Hungary, France and Poland.

A recent study by the European Parliament (Franić and Kovačićek, 2019) has found **significant gender differences within agricultural employment.** First of all, between 2013 and 2017 the female unemployment rate was higher than the male unemployment rate in rural areas (7.6% vs. 7.1% respectively). Second, women in rural areas have more difficulties in finding employment compared to both men in rural areas and to women in urban areas. Third, in rural areas women are more likely to be engaged in informal employment compared to men, making it more difficult for women to find long-term jobs, better career opportunities and access social security. Fourth, there is less potential for women to have ownership and control of land, and to other productive resources compared to men. As a result, the share of self-employed women in rural areas was found to be around 38%, with higher percentages in France, Germany, and Italy. Finally, Franić and Kovačićek (2019) remind us that gender gap is not a feature unique to the agricultural sector. In 2016, for example, **the average gross earnings per hour for women** was 16.3% below the male average hourly gross earnings in all economic sectors of the EU (Estonia having the highest gender pay gap of 25.3%, and Romania the lowest with 5.2%).

Eurostat (2018) also provides supporting evidence of this phenomenon, showing that **older men dominate the management of farms.** According to Eurostat data, more than 71% of farm managers in the EU are male and around 58% are above 55 years old; compared to approximately 10% of farm managers younger than 40 years old, and only 8.6% farm managers who are female.

2.1.3. Employment characteristics

(a) Family, hired and seasonal labour

There are **three main types of labour in the EU agricultural sector:** 1) paid family members labour; 2) paid non-family labour, either permanent or seasonal; 3) unpaid family and non-family labour (which is common in family farms especially in high peak labour seasons) (EC, 2013).

Family farming remains the dominant type of farming in the EU. In 2016, nine out of ten agricultural workers in the EU were either the farm owner or one of his/her family members (Eurostat, 2018). Family labour is important for the resilience of the farm, allowing a more flexible management of labour throughout the year and in particular during the harvest season. Moreover, family members working in the family farm business are often pluri-active and part-time, diversifying their income with off-farm jobs. Thus, the importance of the farming business in the total household income can vary widely, from being almost the sole source of income to being only a minor component (Davidova and Thomson, 2014).

The European Commission (2013) estimated that a large part of agricultural work in the EU is carried out by farm owners and their family members, especially spouses. More specifically, the EC estimated that 92% of the on-farm work is done by family members, whereas hired labour is estimated to contribute to less than 8% of regular farm work.

Many people engaged in agriculture are not officially employed in a farm or they work irregularly in the farming sector. Thus, despite the 2016 total EU agricultural workforce estimate of 20.5 million people, **only 17% were employed on a full-time basis in on-farm activities,** while the remaining 83% were undertaking agricultural activity as a part-time or secondary activity (Eurostat, 2018). When measuring the level of employment in agriculture, the EU uses Annual Work Units (AWUs), which is a measure of the full-time equivalent, providing a better estimate of actual employment in the sector. The total number of AWU in the EU agricultural sector is estimated to be 9.5 million in 2016, and the difference between the 20.5 million workforce and 9.5 million AWU illustrates the size of the part-time labour force in the sector.

(b) Foreign labour

A recent report from the European Commission (JRC, 2019) highlights the **status of migrant labour in rural areas** in the EU. The report indicates that in 2011 the share of foreign labour in the EU agricultural sector was **1.6% for workers from EU Member States** (intra-EU labour) and **2.7% for workers from non-EU countries** (extra-EU labour). Since 2011, both intra- and extra-EU migrant agricultural workers have increased rapidly, while the overall labour outflow from the EU agricultural sector was almost entirely due to movement of MS national workers. Between 2011 and 2017, more than 1.3 million national agricultural workers left the sector. This **outflow was partially compensated by inflows of both intra- and extra-EU migrant workers** (JRC, 2019). During that same period, the number of intra-EU migrants working in the EU agricultural sector increased by 26% and the extra-EU agricultural workers by 31% (a total of 585,000 and 837,000 workers, respectively. However, in the majority of the MS the **share of migrant labour in agriculture is lower than in other sectors,** with the exception of Spain, Italy, and Denmark. In **Denmark,** the share of foreign workers in agriculture increased from 10%

in 2011 to about 20% in 2017. In 2017, around 14% of agricultural workers in Denmark were from another EU MS compared to 6% in 2011, and 5% were from non-EU countries in 2017. In **Spain,** the share of foreign workers in agriculture increased from 20% to 25% between 2011 and 2017, with approximately 7% of agricultural workers coming from another EU MS, 7% from North Africa, and 7% from Central and South America. Similarly, the share of foreign workers in the agricultural sector in **Italy** increased from 10% to 15%, with 8% of agricultural workers coming from EU MS, 4% from Asia, and 3% from North Africa.

2.2. Structured literature review: impacts of the CAP and theoretical examination of institutional frameworks

2.2.1. Introduction

In economics, competitive market theory predicts that policy interventions providing financial support to an economic sector will likely enable attraction and/or maintenance of more resources to the sector than it would have been able to without such interventions. Accordingly, the European Common Agricultural Policy (CAP) with its objectives to stabilize prices and support farm incomes is expected to preserve capital, labour and other productive resources within the agriculture sector. However, the **relative impact of the CAP** is also influenced by market conditions and developments in other industrial sectors, therefore labour and other productive resources may flow out of farming and move to other industrial sectors which are more economically attractive (Vigani et al., 2019). In addition, the **multiple objectives of the CAP may result in counteracting effects.** For instance, subsidies designed to improve overall agriculture productivity will most likely have a negative influence on agricultural employment, as farms may shift towards automated, technology-led and labour-saving approaches. On the contrary, income support for constrained areas would be expected to help labour retention within agriculture, as well as to attract or maintain labour in other rural activities (Vigani et al., 2019). Furthermore, the influence of the CAP on agricultural employment is also subject to the relative **size of expenditures on each policy area,** the local context, local economic performance, and policy implementation, in addition to the **dynamics that interconnect the agricultural sector with the wider economy** (Tocco et al. 2013a; Vigani et al., 2019). Therefore, evidence on the potential effects of the CAP on agricultural employment is quite mixed and context specific, with **different types of effects** depending on the institutional differences and variation in the heterogeneous farming and market structures across the EU Member States. The methodological approach to this task is detailed in Annex A.1.

2.2.2. Results of the literature review

Estimating the impact of the CAP on agricultural and rural employment is a challenging task because of the complexity of the policy, the different ways MS implement it, and the heterogeneity in terms of agro-ecological and socio-economical characteristics of the EU regions and MS (Petrick and Zier, 2012; European Court of Auditors, 2013; Dupraz and Latruffe, 2015; World Bank, 2018).

In terms of support, the portfolio of the CAP instruments supporting farmers and the rural economy is varied and complex, and it has changed significantly over time through regular reforms. Currently, the CAP is structured in three main policy strands:

(I) ***Income support*** **(or Pillar I)** provides farmers with direct payments aiming to stabilize their income or to adopt environmentally friendly practices and for delivering public goods. Direct payments are (for the most part) not linked to the production of agricultural goods (i.e. decoupled) but are fixed amount of payments based either on entitlements allocated to farmers (the basic

payment scheme or BPS) or on the eligible hectares declared by farmers (the single area payment scheme or SAPS, which is applied to the majority MS who joined the EU after 2003). The EU MS can also voluntarily provide farmers with a limited amount of payments linked (i.e. coupled) to certain products or sectors which are undergoing difficulties. In addition, the *"green direct payment"* (i.e. greening) supports farmers who voluntarily adopt environmentally and climate friendly practices, while the *"young farmer payment"* is an additional help for farmers under 35 years old.

(II) ***Rural development*** **(or Pillar II)** consists of 20 measures (e.g. farmers training, advisory services, quality schemes, investments in assets or forestry) designed to address the specific needs of rural areas. Each MS can voluntarily select the most suitable measures for the needs of their rural areas through national and regional programmes. A wide variety of rural development measures have been adopted across the MS, and currently there are 118 different rural development programmes (RDP) in the 28 MS, operating at either national or regional level.

(III) ***Market measures*** are designed to deal with market risks such as price volatility or sudden drop of products demand. These measures differ substantially in that they have an emergency nature (i.e. farmers receive payments only if a risk occurs) instead of being regular payments like in the case of Pillar I and II.

Given the complexity of the CAP, the heterogeneity of the farming systems across MS and (last but not least) the variety of scientific methods used by researchers, it is not surprising that the results of the literature estimating or predicting the impact on agricultural employment are variable and it is common to find studies reaching opposite conclusions. In general, studies indicating a **positive impact of the CAP on agricultural and rural employment** suggest that policy supports for farm income, training and investments are likely to have helped the creation and retention of rural jobs (EC, 2006; Breustedt and Glauben, 2007; Křístková and Ratinger, 2012; Kaditi, 2013; Olper et al., 2014; Angioloni et al., 2019; Garrone et al., 2019). On the other hand, there is an argument that the CAP may have encouraged farms to adopt more intensive and mechanized agriculture that reduced their need for on-farm labour (Edan et al., 2009; Gallardo and Sauer, 2018).

Finally, it is worth noting, that some studies do not find any significant impact of the different CAP interventions on agricultural and rural employment (Douarin, 2008; Pufahl and Weiss, 2009; Becker et al., 2010; Salvioni and Sciulli, 2011; Corsi and Salvioni, 2012; Genius, 2013).

This review illustrates how the current findings in the literature are fragmented and do not provide a single message with regards to the impact of the CAP on agricultural and rural employment. The heterogeneity of the CAP impact emerging from the literature review can be further reinforced in the future CAP if the current Strategic Plans are confirmed. This could be mainly due to the expected increased subsidiarity and flexibility in implementing the policy at Member State or regional level, which can result in even more heterogeneous impacts across Member States (see Massot and Negre, 2018). The remainder of this section is structured around the main types of CAP impact on employment identified in the literature, which can be grouped as follows: i) negative direct effects; ii) positive direct effects; iii) mixed direct effects; and, iv) indirect effects (that can be either positive or negative).

(c) Negative direct effects of the CAP on employment

A number of studies have suggested that the CAP induced a reduction in the total number of workers, affecting both family and non-family labour (e.g. Bournaris and Manos, 2012; Manos et al., 2011; Petrick

and Zier, 2011; Psaltopoulos et al., 2011; and Gohin and Latruffe, 2006). Three **main reasons can be identified to explain this negative effect** (Van Herck, 2009):

(a) Subsidies are likely to be unequally distributed among farmers and as a consequence the farmers receiving relatively less subsidies might experience a relative decline in farm income and are therefore more incentivized to search for employment alternatives.
(b) The farms receiving relatively higher subsidies have more possibility to take over other farms and therefore to achieve economies of scales with an improved efficiency in allocating labour.
(c) The higher income generated by subsidies can accelerate the capital/labour substitution, promoting a technology-intensive and mechanised agriculture which requires fewer labour inputs.

For these reasons, Van Herck (2009) argued that regions with high subsidy per worker are more likely to have workers exiting the agricultural sector. However, she also suggested that the **effect of the CAP on employment varies due to the relative intensity of the support.**

Manos et al. (2011), working in Greece, suggested that the implementation of decoupling subsidies can lead to a major reduction in family and non-family labour in the Greek northern regions and to the generation of social problems particularly among the older population, seasonal agricultural workers (mainly foreign immigrants), and female employment. The negative effect of decoupling is also reported by Hennessy and Rehman (2008) in Ireland and by Woldehanna et al. (2000) in the Netherlands, suggesting that the decoupling of direct payments from production would probably affect how farmers allocate their time, increasing the probability of farmers participating in the employment outside of agriculture.

Agricultural employment in new Member States was also directly negatively affected by the CAP after 2004 accession. Baum et al. (2006) found that family and subsistence farming were negatively affected by the CAP in Czech Republic, Latvia, Hungary, Poland, Slovakia and Romania. Elek et al. (2010) suggested that part-time and seasonal jobs were the most negatively affected, while only large farms in Hungary were able to hire more agricultural labour, mostly male workers.

Negative impacts of the CAP on rural employment are disproportionate across rural industries. Gohin and Latruffe (2006) and Psaltopoulos et al. (2011) indicated that the negative employment effect of the CAP seems higher on the primary and secondary rural sectors, while the food industry is only partially affected by the CAP, mostly indicating positive effects on the employment rate.

Overall, the **majority of empirical studies have indicated a negative impact of the CAP on agricultural and rural employment levels.** For example, the European Parliament Committee on Agriculture and Rural Development (2015) noted the following: *"The inescapable conclusion is that notwithstanding one reform after another, the systems applied to bring the CAP up to date have always helped a dominant mode of agricultural development which […] relies on increasingly concentrated and specialised farms that practise intensive farming and are substituting capital for employment" (see also the European Parliament resolution of 27 October 2016 on how the CAP can improve job creation in rural areas[11]).*

Interestingly, a recent study from Rizov et al. (2018) analysed the effects of the CAP payments on the indirectly generated non-farm jobs (a rarely addressed research question), suggesting that there might exist inter-industry spillovers generated by the CAP payments that favour non-farm employment. The authors found that during the period 2008-2014 these spillover effects were rather small, but

[11] www.europarl.europa.eu/doceo/document/TA-8-2016-0427_EN.html?redirect

economically, significant in the UK. In particular, Pillar I had net positive spill overs on non-farm employment both in rural and urban areas, while Pillar II had a positive effect in rural areas and within agricultural supply chains.

(d) Positive direct effects

A total of thirteen studies indicate direct positive effects of the CAP on creating or maintaining agricultural and rural employment. The main reason identified in the literature explaining why the **CAP subsidies might have a positive role in creating or maintaining jobs** in the agricultural sector is the income effect, i.e. CAP subsidies fill the gap between agricultural and non-agricultural income, therefore reducing the workers' incentives to abandon the primary sector in search of higher salaries in the secondary or tertiary sectors.

The main argument in support of the positive impact of the CAP on agricultural employment is that almost 30% of farms would cease their farming activities if they had not received external support, as indicated by the results of the FP7 European Project *"CAP-IRE: Assessing the multiple impacts of the Common Agricultural Policies (CAP) on rural economies"* (2011). Similarly, the findings of the FP6 European Project *"IDEMA – The Impact of Decoupling and Modulation in the European Union: a sectoral and farm level assessment"* (2007) provide a thorough argument in favour of the CAP and its impact on employment. The study indicated that agriculture can be more profitable than off-farm labour if policy support is well directed and under specific land management regimes, for example grassland management can become an additional source of farm income reducing the incentives for farmers to search for alternative off-farm jobs as a mean to top-up their income. The European Commission report *"Employment in rural areas: closing the jobs gap"* (2006) stated that policy support for forestry, training, agricultural investment, and rural development are effective instruments in creating rural jobs. In addition, rural diversification measures have created temporary job opportunities and maintained existing agricultural jobs in environmental and rural development activities. The findings of Peerlings et al. (2014) support this argument, by indicating that small farmers are more likely to stop their agricultural activities if the CAP was to be removed. **Small farms are more dependent on the income support provided by the CAP** than larger and specialised farms. Manos et al. (2013) also suggested that halving the CAP budget with respect the 2008 levels of subsidies would negatively **affect the amount of family work dedicated to agriculture.** In this scenario, female employment in agriculture was more negatively affected by a reduction of CAP subsidies than male employment. However, a complete removal of the CAP would negatively affect agricultural and rural labour even more strongly.

Balamou et al. (2008) estimated that decreasing coupled support by 30% may lead to a reduction of total rural employment of about 11%. In Romania, Vincze and Kerekes (2009) interviewed local experts in agricultural consultancy who suggested that Romania can benefit from the CAP subsidies in sustaining employment in agriculture, especially through rural development measures targeted at large commercial farms. Neuwirth et al (2010) and Nordin (2014) found subsidies to have a positive impact on job creation in Austria and Sweden. Research by Salvioni and Sciulli (2011) suggested that rural subsides in Italy have helped increase on-farm family labour for recipients, compared to those who did not receive the subsidies. Sieber et al. (2013) have suggested that the CAP subsidies have a positive effect on reducing unemployment rates in the agricultural sector, because a reduction in CAP subsidies would provoke a decrease in the farmed area and an increase in abandoned arable land and forests. They argue therefore that **CAP subsidies help to improve the distribution of production factors** such as labour and land among different economics sectors at MS level. Olper at al. (2014), looking across all the EU regions, indicated that the CAP subsidies, especially Pillar I payments, had a

positive impact by keeping on-farm agricultural labour, and reducing the out-farm flow of agricultural workers to other sectors by about 24-28%.

Four recent studies have also found evidence for a positive effect of the CAP. Schuh et al. (2016) indicate that the correlation between agricultural employment growth and Pillar I is rather weak, while **Pillar 2 Rural Development policies are having a stronger positive effect on rural jobs.** This is confirmed by Di Cataldo (2017) who found a positive effect of EU Objective 1 structural funds (an economic support from the EC dedicated to those *"Regions whose development is lagging behind")* on the labour market and economic performance of Cornwall and South Yorkshire in UK; and by Angioloni et al. (2019) who found a positive relationship between the number of jobs created and the amount of LEADER funds in Northern Ireland.

Regarding non-agricultural jobs in rural areas, Blomquist and Nordin (2017) found that the decoupling reform in 2005 in Sweden had a positive impact on non-agricultural jobs and the authors estimated that each new job created had a cost of approximately $26,000 per job.

(e) Mixed direct effects

Twelve studies have indicated mixed direct effects of the CAP on agricultural and rural employment. Křístková and Ratinger (2012) suggested that, because **direct payments** sustain the competitiveness of the agricultural sector, their reduction may lead to labour outflow as a consequence of the loss of competitiveness of the sector; whereas allocating more funds to investment subsidies in **Pillar II can stimulate all the sectors of the rural economy** (e.g. tourism, restoration) and thus resulting in a negative impact on agricultural employment rates. Petrick and Zier (2012) found that decoupled subsidies had a negative effect on agricultural employment rates, but found no impact on employment from Pillar 1 direct payments, rural development subsidies, Less Favoured Areas (LFA), and agri-environment schemes. Tocco et al. (2012; 2013b) found that the **impact of the CAP differs across the Member States.** Their findings suggested that total subsidies were negatively correlated with reduction of agricultural employment in Hungary and Poland, while there was no significant impact in Italy and France. Kaditi (2013) found that rural development subsidies in Greece have reduced both family and hired labour, while decoupled subsidies may have led to increase both types of labour. Dupraz and Latruffe (2015) argued that the **impact of the CAP depends on the type of the subsidy;** suggesting that crop area and single farm payments had negative effect on agricultural employment rate, whereas investment subsidies, LFA and agri-environmental schemes had positive impacts on employment. Moreover, the rural development payments conditional on job creation as a primary objective can have a positive impact on employment in rural areas. The European Court of Auditors (2013) found that jobs were created in MS who provided **conditional subsidies** (Poland, the Czech Republic and the United Kingdom), whereas no impact was found in France, Italy and Sweden where rural development subsidies were not conditional upon job creation.

Mixed effects have been found also in recent studies. A report of the World Bank (2018) argues that the CAP matters for the creation of jobs and for the reduction of poverty in the EU, although the extent of the effect depends on the level of structural transformation of a given Member States. Mantino (2019) focuses on the case of Italy showing empirically that **Pillar I appears to negatively affect farm employment, while Pillar II shows positive effects.** Garrone et al. (2019) studied 210 EU regions over the period 2004-2014 finding that **decoupled Pillar I payments** reduced the outflow of labour from

agriculture, but **coupled Pillar I payments** did not help preserve jobs in agriculture, while the **impact of Pillar II is mixed.** The authors also estimated that:

(I) an increase of 10% of the CAP budget would prevent 16,000 people from leaving the EU agriculture sector each year, which corresponds to 0.16% of the total agricultural workers of the EU (estimated to 9.7 million in 2016);
(II) a 10% shift of the CAP budget from Pillar I coupled payments to Pillar I decoupled payments would preserve 13,000 agricultural jobs each year. However, the costs are large and estimates suggest that each preserved job could costs more than € 300,000 per year (or more than € 25,000 per month).

(f) Indirect Effects of the CAP on employment

The CAP and each of its support instruments can also *"indirectly"* impact jobs in the agricultural sector and rural areas through a number of different channels, such as agricultural intensification, income and education.

A number of studies from the literature search found ***"indirect"* and negative employment effects** of the CAP. Wier et al. (2002) argued that the CAP subsidies had indirectly reduced the demand for labour in the European Union agricultural sector, as farmers did not have incentives to increase their production. Mattas et al. (2008) argued that the CAP had promoted the adoption of intensive agricultural methods that decrease the use of labour, as the sector became more productive, competitive, and led by technological innovation that does not heavily rely on labour. Similarly, Alexiadis et al. (2013) noted that the **subsidies had encouraged farmers to adopt intensive and mechanised agricultural production methods** in recent years, especially in North Europe, which resulted in higher labour productivity that led also to lower demand for labour.

Another indirect channel of CAP influence on agricultural employment is through **commodity prices.** The decoupling introduced after the 2003 CAP reform affected agricultural prices, which in turn affected agricultural incomes and employment. In particular, Topp and Mitchell (2003), and Hennessy and Rehman (2006), suggested that price reduction may have led to rapid changes in the EU farming systems, such as changes in crops and outputs, which ultimately resulted in falling incomes and employment in Ireland and Scotland. Manos et al. (2009) argued that decoupling subsidies had severely reduced labour inputs due to changes in crop plans, as farmers were willing to substitute higher profitable/higher value crops with less profitable ones that have lower labour inputs. This may have caused unemployment rates to increase in some areas of the EU.

The **indirect education effect** is described by Berlinschi et al (2011): as CAP subsidies increase and stabilize income, farmers are able to invest in the education of their children who will accordingly have better job opportunities with higher income in the industrial or services sectors. In this scenario, the negative impact of the CAP is long- rather than short-term, and the results are only visible after one generation of farmers has passed.

On the other hand, Agrosynergie (2011) found **indirect positive impacts** from the CAP on employment, arguing that family labour will reduce if direct payments were removed because of an increase in opportunity cost (i.e. the hypothetical loss due to a choice over another, which in this context means that lower direct payments would lower the farming income, making off-farm labour more attractive). In addition, the European Commission (2015) argued that **subsidies in Pillar II for training** can have a significant positive impact on maintaining and creating jobs in agriculture and rural sectors by improving the professional skills and capabilities of the labour force to adapt with structural changes and diversification of activities.

2.2.3. Current and future CAP and employment

As discussed in the previous sections, the literature on the impact of the CAP on agricultural and rural employment provides mixed predictions. Moreover, **different types of policies may have different impact on employment.** This is particularly important when considering the CAP, as it is composed of a large number of different policy measures, each addressing specific challenges affecting the agricultural sector and often overlapping. Some CAP measures have been designed specifically to address the employment issue in the agricultural sector, but other measures go beyond directly creating and protecting agricultural and rural employment and focus on other issues such as price stabilisation, income support, young farmers support, and environmental challenges.

In the **current CAP** for the programming period 2014-2020, the measures that have been designed (although not exclusively) to address the employment issues can be found in both Pillar I (BPS/SAPS) and Pillar II (Measures 4, 6, 7, 8, 10, 11 and 19). **Table 1** provides an analysis combining the various elements of the current and future CAP programmes, which have been designed by the EC to support agricultural and rural jobs, and the studies compiled from the structured literature review of the previous section.

The Table illustrates that the Basic Payment Scheme, investments in physical assets, and farm and business development, have both positive and negative effects on agricultural employment. The negative impact comes from the intensification and mechanisation of agricultural process promoted by the direct payments and investment support for farmers, which reduces their dependence on labour inputs. Whereas the positive impact is predicted based on the literature suggesting that the direct payments and business development had a significant influence on keeping farmers (especially small farmers) in the agricultural sector and supported them to not quit their lands which helped in maintaining both family and hired labour.

The Pillar 2 rural development policies for basic services, village renewal and investments in forest areas are expected to have a positive impact on keeping and attracting labour force in the agricultural and rural sector. This is because these policies can close the urban-rural gap and therefore can motivate young farmers to remain, as well as help attract new entrants and workers. Similarly, agri-environmental schemes and organic farming provide new opportunities for labour which can have an indirect effect on rural employment. Moreover, the European Parliament (2015: 15) suggests that *"bottom-up approaches to local development such as LEADER/CLLD have proven to be effective in terms of numbers of jobs created and of low levels of public expenditure per job created" (see also the European Parliament resolution of 27 October 2016[12])*. The European Commission (2015) has predicted that LEADER approach will cover 51% of the EU's rural population; providing training to 3.9 million people to improve labour skills of rural inhabitants.

Regarding the **CAP post-2020** proposed by the European Commission (2018) it is particularly difficult to predict the potential employment effects of the *"Income support for young farmer"* as this measure became compulsory in all Member States only from the period 2007-2013 and, to the best of our knowledge, no published study to date has specifically focused on its potential impacts. A recent study on the impacts of the 2014-2020 CAP on generational renewal, local development and jobs in rural areas (Dwyer et al., in press) has found that CAP young farmer oriented measures[13] help maintaining employment in agriculture through two main channels, namely by supporting farm succession and

[12] www.europarl.europa.eu/doceo/document/TA-8-2016-0427_EN.html?redirect

[13] In particular young farmer supplements to Direct Payments in Pillar 1, young farmer business start-up aid in Pillar 2 (Measure 6.1), Pillar 2 investment measures which are modulated (higher rates) in favour of young farmers (e.g. M4.1) and supporting measures tailored to accompany them (e.g. M1 training, M2 advice, M16 co-operation.

generating local jobs in both farming and its up- and downstream sectors. However, this positive impact remains very limited because of the many other economic factors influencing farming employment at the same time.

Table 1: Current and future CAP and its potential effects on agricultural and rural labour

CAP 2014-2020	Positive effect on labour		Negative effect on labour	
	Direct	Indirect	Direct	Indirect
Pillar I: direct payments to farmers				
Basic payment scheme (BPS)/Single area payment scheme (SAPS)	√	---	√	---
Pillar II: rural development policy				
M04 – Investments in physical assets	√	---	√	---
M06 – Farm & business development	√	---	√	---
M07 – Basic services & village renewal	√	---	---	---
M08 – Investments in forest areas	√	---	---	---
M10 – Agri-environment-climate	---	√	---	---
M11 – Organic farming	---	√	---	---
M19 – LEADER/CLLD	√	---	---	---
CAP – Post 2020 proposal				
Direct payments to farmers				
Basic income support	√	---	√	---
Income support for young farmers	---	---	---	---
Schemes for the climate and the environment	---	√	---	---
Rural development				
Environmental, climate and other management commitments	---	√	---	---
Investments	√	---	√	---

2.3. Desk research: relations between agricultural policies and EU social initiatives

Alongside the CAP, a number of socio-economic initiatives have been implemented or proposed at the European level, which may have an impact on the socio-economic environment of rural areas and ultimately influence agricultural and rural employment, either in terms of the size or the structure of the agricultural labour market. At the moment, the interaction between the CAP and these initiatives is under-researched, yet the identification of potential synergies and/or overlapping areas of action between the CAP and these initiatives is very relevant for understanding the current and future challenges and opportunities of farming employment in the EU. In this section, we identify and discuss **four initiatives,** namely: the European social dialogue (ESD), the EU Social Pillar (ESP), the Europe 2020 strategy and the Marrakesh Political Declaration. The aim of this section is to provide a brief overview of these initiatives, highlight potential impacts of these initiatives on agricultural employment, and the possible contribution of the CAP to these initiatives.

2.3.1. European social dialogue

The *"European social dialogue"* (ESD) was introduced in 1992 in the Social Agreement of the Maastricht Treaty, and subsequently included in Articles 138 and 139 of the European Communities Treaty in 1997. The social dialogue consists of bipartite and tripartite discussions, negotiations and agreements between industry representatives. Bipartite dialogues are actions between employers and organisations representing the workers, while tripartite dialogue includes public authorities as well (Smismans, 2008).

In order to understand the relationship between agricultural employment in the EU and the ESD, the report provided by the Eurofound in 2016 is particularly useful. Since the agricultural labour market is characterised by a high proportion of self-employed, family members, part-time, seasonal, as well as migrant workers, the Eurofound (2016) suggests that the sector is more likely to have **illegal work practices** compared to other sectors. The informal labour carried out in agriculture by family members makes farms more similar to household units rather than to business units. This is even more the case considering that many farmers often work only part-time in the farming business, topping up their income with off-farm work.

The labour market structure of the agricultural sector in the EU has resulted in low unionisation compared to the industrial and services sectors. In spite of that, in many MS, *cooperatives* act as farmers' representatives or help farmers in collectively negotiate contracts terms with other actors of the supply chain (Eurofound, 2016). The role of coordinator during **collective negotiations** taken by cooperatives is more frequent among old MS, while in countries such as Poland, Slovakia, and the Baltic countries they are less common (Eurofound, 2016). However, while the role of cooperatives in negotiating prices or terms of contracts for purchases is well described, the current literature does not provide much information on the role of cooperatives in negotiating agriculture labour issues within the framework of the ESD. Eurofound (2016) also reported on the **coverage of trade unions** relevant to the agricultural sector. According to Eurofound, in 2016 in the EU there were 63 agriculture-related trade unions, which can be divided in two main types: i) general or cross-sectorial unions, which include multiple sectors in the economy; ii) unions for the agricultural, agri-industrial and/or food sectors.

Degryse (2015) suggested that the activities of the Social dialogue in the agriculture sector have been quite regular since its creation and through the last two decades. Such activities consisted mainly in bipartite and tripartite discussions between representatives of MS, workers' and employers' in the agriculture sector. The main topics addressed in these discussions concerned working hours of wage-labour, social dimensions of the CAP, training and education, employment, accident prevention, and health and safety. A particularly important topic addressed by the ESD in relation to agriculture is technology intensification, especially in relation to risks faced by workers when operating new machines and tools and the need for more training and safety measures (Degryse, 2015).

In terms of **how the CAP can contribute to the activities of the ESD,** it should be noted that the CAP is the actual backdrop of the social dialogue within the agricultural sector, especially between two actors: the European Federation of Food, Agriculture and Tourism Trade Unions (EFFAT), which are the workers' representatives; and the Employers' Group of Agricultural Organisations in the EC (COPA-COGECA), which are the employers' representatives. The CAP has significantly influenced the ESD activities as any CAP reform can modify the socio-economic equilibrium of rural areas thereby creating new needs for social dialogue between the parties involved. This is particularly the case for the following CAP elements: Basic payment scheme (BPS)/Single area payment scheme (SAPS); M04 – Investments in physical assets; M06 – Farm & business development; M07 – Basic services & village renewal; M08 – Investments in forest areas; M19 – LEADER/CLLD; which, as shown in **Table 1,** are the ones with direct effects on agricultural employment. Thus, we can anticipate that the future CAP post 2020 will strengthen the social dialogue through extending the partnership consultations to NGOs and other rural/economic bodies.

2.3.2. EU social Pillar

The EU social Pillar (ESP) was announced by the President of the European Commission in Gothenburg during the EU social summit in 2017. The ESP has the objective of strengthening the social dimension of the EU's policies, and especially to promote fair labour markets and inclusive growth (EC, 2017a). The

ESP was developed under 20 key principles that address labour conditions, divided into three categories (EC, 2017a):

(1) Equal opportunities and access to the labour market.
(2) Fair working conditions.
(3) Social protection and inclusion.

One key element of the ESP is a new institution, the **European Labour Authority (ELA).** The ELA should be established in 2019 and should reach full operational capacity by 2024. The ELA will be the common Labour Authority for the EU Single Market, aiming to guarantee the effectiveness and implementation of EU rules on labour mobility, and ensuring that fair social security rules are enforced and coordinated throughout the Single Market (EC, 2019). The underlying reason of establishing the ELA is to protect EU workers who live, commute or carry out services in another MS (EC, 2019). If the ELA delivers its objectives, it is reasonable to expect significant influences (and maybe even benefits) on the agricultural labour market in the EU, especially considering the high number of intra-EU seasonal migrant workers in the sector.

The potential importance of the ELA was also reported by the ***"European Platform Tackling Undeclared Work"*** in their seminar *"Tackling undeclared work in the agricultural sector"* (Williams, 2019). A number of participants of the seminar have identified the need for cross-border cooperation between tax authorities and law enforcement and for social security and protection of the workers' rights. The participants perceived such cooperation possible through the European Platform Tackling Undeclared Work and potentially the European Labour Authority (Williams, 2019).

The relationship between the CAP and the ESP is not yet clear as it is such a recent innovation. The objectives of the ESP and the CAP are quite different, the former promoting fair and inclusive labour markets, the latter guaranteeing farmers a minimum income, so it is unlikely that they will overlap. On the contrary, it is possible that they will be complementary, in that the **ESP can help reducing some failures of the EU agricultural market such as illegal working conditions.**

2.3.3. Europe 2020 strategy

On the 3rd March 2010 the EC launched the Europe 2020 strategy as a follow up of the Lisbon Strategy of the period 2000–2010. Europe 2020 is a 10-year strategy aiming to economic development and *"smart, sustainable, inclusive growth"* through improved coordination and integration between national and European policies.

The strategy outlined five main targets to achieve its priorities (EC, 2010):

(1) 75% employment rate for the population aged between 20 to 64;
(2) 3% of the EU's GDP spent on Research and Development;
(3) meeting the "20/20/20" climate and energy targets: 20% cut in greenhouse gas emissions (from 1990 levels); achieve 20% of EU energy from renewables; 20% improvement in energy efficiency;
(4) reduce the rate of early school dropout to less than 10% and achieve tertiary degree for at least 40% of the young population;
(5) reduce to less than 20 million the EU people at risk of poverty.

During the period between 2008 and 2017, employment rate grew constantly in professional, scientific, technical, and administrative activities, and the overall employment rate in the EU has reached 72.2% by the end of 2017, making the target of the Europe 2020 strategy within reach (Eurostat, 2018). However, during the same period, Eurostat (2018) reports a **decline in the agricultural employment**

rate as well as in the construction and manufacturing sectors, although the 2020 strategy is expected to have a positive impact on agricultural employment.

Viola et al. (2016) view the Europe 2020 strategy as a green-economy-oriented strategy, arguing that it may provide a strong ground for the creation of new, sustainable and decent jobs in the green economy, and in sectors that promote environmental quality, in the same way that the proposed **Green New Deal for Europe** can have a solid impact on job creation and life quality. Similarly, Pociovălișteanu et al. (2015) noted that the adoption of policies (developed according to the objectives of the 2020 strategy) to promote green jobs will change the structure of EU production and labour market. In particular, the authors expect an increase in labour demand in modern and environmentally friendly sectors at the expenses of more traditional sectors. In the agricultural sector, the 2020 strategy could potentially have an impact on job creation in organic farming because of its environmental sustainability (Pociovălișteanu et al., 2015). Also, Mazur-Wierzbicka (2015) argues that corporate social responsibility is embedded in the 2020 strategy, which promotes the continuous development of workers' skills, and ensures a sufficient standard of living for the workers.

According to a report of the World Bank (2018), the current CAP 2014-2020 also aligns with Europe's 2020 strategy. In particular, the report highlights that the CAP enhances the smart growth of the agricultural sector by fostering education, knowledge, innovation, and digitalization. The sustainable growth of the agricultural sector is facilitated by the CAP by encouraging environmentally friendly and resource efficient production practices (greening) while supporting the competitiveness of the sector. Finally, inclusive growth is fostered by the CAP by enhancing labour market participation, skills acquisition, and reducing poverty.

These aspects already suggest contribution of the CAP in achieving the objectives of the 2020 strategy, but there are additional evidences that indicate how the CAP can have an even more significant role. In the EU legislation, the second objective of the CAP is *"to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture."* This clearly suggests that the **CAP aims to reduce poverty,** which is in line with the fifth objective of the 2020 strategy (Lanos et al., 2019).

Moreover, the support of the CAP, through the Pillar II measures, to **bio-energy** production from agriculture and forestry and the use of bio-energy on farms and in rural areas, indicates a correspondence with the second objective of the 2020 Strategy on cutting atmospheric emissions and enhancing renewable energy. This is even more evident by looking at the proposal for the future CAP post 2020, where a number of the future objectives are directly linked to the 2020 Strategy[14]:

- Ensuring viable farm income: support viable farm income and resilience across the Union to enhance food security.
- Efficient soil management: foster sustainable development and efficient management of natural resources such as water, soil and air.
- Agriculture and climate mitigation: contribute to climate change mitigation and adaptation, as well as sustainable energy.
- Jobs and growth in rural areas: promote employment, growth, social inclusion and local development in rural areas, including bio economy and sustainable forestry.

[14] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap/key-policy-objectives-future-cap_en

2.3.4. Marrakesh Political Declaration

The Marrakesh Political Declaration is one of the most important outcomes of the 5th Euro-African Ministerial Conference on Migration and Development, held on the 2nd of May 2018 in Marrakesh, which defines the current multi-annual cooperation programme of the Rabat Process.

The Rabat Process is a regional multilateral dialogue between the countries on the migration routes linking Central, West and Northern Africa with Europe. It started in 2006 and the dialogue concerns technical and political issues related to migration and development, bringing together countries of origin, transit and destination of the migration routes. The partners countries agree every three years a multi-annual cooperation programme.

During the 5th conference of the Rabat Process, discussions focussed on strengthening the cooperation among partner countries, the prevention of irregular migration and the development and implementation of legal pathways. The conference resulted in the **Marrakesh Declaration and Action Plan**[15] for the multi-annual cooperation programme 2018-2020. The plan follows the Joint Valletta Action Plan 2014-2017 and defines 10 objectives grouped in 5 domains to be achieved through 23 actions:

- **Domain 1:** Development benefits of migration/Root causes of irregular migration & forced displacement
  - (a) Maximise the positive impact of regular migration for development (3 actions)
  - (b) Understand the root causes of irregular migration & forced displacement (2 actions)
- **Domain 2:** Legal migration and mobility
  - (a) Promote regular migration & mobility (especially young people, women) (3 actions)
  - (b) Encourage facilitation of visa issuing procedures (2 actions)
- **Domain 3:** Protection and asylum
  - (a) Strengthen the protection of refugees and the forcibly displaced (2 actions)
  - (b) Promote the integration of refugees and the forcibly displaced into host communities (+2 actions)
- **Domain 4:** Irregular migration, migrant smuggling and trafficking in human beings (THB)
  - (a) Build capacities for border management and combating migrant smuggling and THB (3 actions)
  - (b) Improve the protection of those who have been smuggled and of victims of THB (2 actions)
- **Domain 5:** Return, readmission and reintegration
  - (a) Build capacities for identification processes & the issuing of travel documents (actions)
  - (b) Encourage the safe return and sustainable reintegration of migrants (2 actions)

In addition, the Marrakesh Declaration and Action Plan defines **six cross-cutting priorities** relevant to all domains:

(1) A human rights-based approach.
(2) Issues of gender and protection of migrants in vulnerable situations.
(3) The fight against xenophobia, racism and discrimination.
(4) A regional approach.
(5) An inclusive and multi-stakeholder approach.
(6) Data collection, analysis and sharing.

How the CAP can relate to the Marrakesh Declaration and Action Plan is very much an open question. On the one hand, the Marrakesh Declaration could be complementary to the CAP as the current

[15] https://ec.europa.eu/home-affairs/sites/homeaffairs/files/20180503_declaration-and-action-plan-marrakesh_en.pdf

framework and tools do not address directly the issue of migrant workers. On the other hand, it is difficult to foresee how such complementarity could be realized, because the CAP is a policy based on legislation and applied by all MS, while the **Marrakesh Declaration is a non-binding cooperation framework** operating on a voluntary basis, where each MS can decide whether and which actions it will implement. Moreover, it should be noted that the future CAP will start from 2021 (or beyond) and, although at the moment the proposal contains references to migrant workers[16], by the time of its start a **new Action Plan of the Rabat Process** will be in place.

Despite the uncertain nature of the relationship between the future CAP and the Marrakesh Declaration, there is little doubt that the current discussions about the future CAP recognise the growing dependence of the agricultural sector on migrant workers (both intra- and extra-EU). The communication of the European Commission on *"The Future of Food and Farming"* (EC, 2017c) clearly states that *"the future CAP must play a larger role in implementing the outcome of the Valetta Summit, addressing the root causes of migration."* Furthermore, the communication develops **six potential actions** (Matthews, 2018):

(1) The knowledge and know-how generated by the CAP-supported projects should be used to develop employment and revenue opportunities in regions of origin and transit of migrants.
(2) Explore opportunities from the EU-Africa Union exchange schemes for young farmers along the lines of ERASMUS+.
(3) Deepening cooperation on agricultural research and innovation through the relevant EU policies and instruments.
(4) Support and develop strategic policy cooperation and dialogue with the Africa Union on issues related to agriculture and rural development in order to help the region develop its agri-food economy.
(5) Offering opportunities for seasonal workers in agriculture.
(6) Using EU rural development programmes to help settle and integrate legal migrants, refugees in particular, into rural communities, building on the experience of Community-Led Local Development/LEADER projects.

2.4. Preliminary answers and new research questions

The results of the literature review presented in this section demonstrate that **agricultural labour markets have undergone significant changes over recent decades,** justifying the role of the CAP for sustaining agricultural employment through direct payments as well as rural development programmes. The literature review also indicates that both the **development path of agricultural jobs and the impact of the CAP diverge across European countries and regions.** This calls for a finer differentiation between countries and regions where farms are still rapidly restructuring (or may be facing a rapid restructuring as the older generation disappears in the coming decade), and others where farm structures are more stable as they have already achieved a high degree of modernisation and/or capitalisation. If the future EU trend is to be a continuation of declining employment, to what extent can diversification, pluriactivity and adding value act to slow, stop or even reverse farm employment decline? And is this more feasible in the territories which have already restructured, or can it also smooth the restructuring process in those territories where radical changes are still anticipated? The next two sections of this study explore these questions, through both a quantitative analysis of trends and patterns (Section 3) and a focused qualitative analysis of eight EU regions with different historic, geographic and socio-economic agricultural profiles (Section 4).

[16] The proposal should "*seek coherent action among its policies in line with its global dimension, notably on trade, migration and sustainable development*" (European Commission, 2017).

3. EU LEVEL RESEARCH: STATISTICAL ANALYSIS AND MAPPING

KEY FINDINGS

- An ageing population is increasingly becoming a structural problem across the agricultural sectors of the European Union. The active labour force is exiting the sector (due to retirement) at a faster rate than entering, with declining numbers of farms managed by young farmers. Consolidation of farm holdings is picking up, with the number of farms with a utilised agricultural area above 100ha increasing.
- The agricultural sector remains economically more important in newer Member States. In addition, developments are often relatively homogenous within a single Member State, with only limited cross-border spill-overs.
- The forecast analysis points to further consolidation amongst larger farms. The farm holders' population will continue to contract. This pattern is also forecasted among family workers, however not within the non-regular labour force.

This section aims at providing quantitative evidence on the trends and determinants identified in the literature review and set forth in the previous section. More specifically, this section lays out three types of statistical data:

(a) historic data on farming employment at EU level;
(b) territorial data on the characteristics and performance of the agricultural sector at national and regional level; and
(c) forecast estimates on EU farming employment in the next programming period.

These three types of data are analysed in the following three sub-sections, respectively.

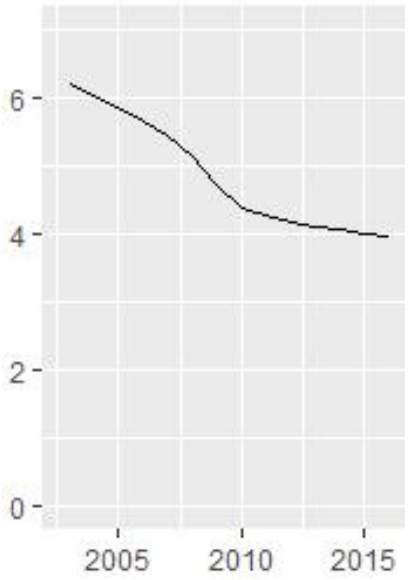
3.1. Analysis of historic trends in EU farming employment

Across the European Union (EU-27), **farm holders** are seeing a significant decline starting in the early 2000s, with a drop of more than one-third between 2003 and 2016. A pronounced decline took place in the late 2000s, with the speed of decline slowly stabilising in the early 2010s **(Figure 1).** This stabilisation can be partly attributed to the outbreak of the financial crisis in 2008, which reduced the overall speed of labour reallocation from the primary to the secondary and tertiary sectors. Similarly, **family workers** have been steadily declining since the early 2000s across European farms **(Figure 2),** from 4.6 million in 2003 to 2.6 million in 2016.

Across the EU, **regular non-family workers** are increasing in absolute numbers since 2007 to levels above that in 2005 **(Figure 3). Non-regular non-family workers** have declined between 2005 and 2010, with hints of a positive development in the mid-2010s **(Figure 4).**

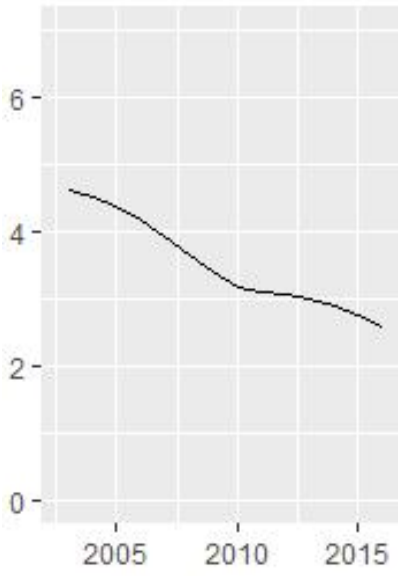
Taken together, the **total labour force** employed in the sector (i.e. the whole population of sole farm holders, family workers and both regular and non-regular non-family workers) has declined steadily and substantially, registering a 30%-decrease within one decade **(Figure 5).**

Figure 1: Farm sole holders (in millions AWU) in the EU27



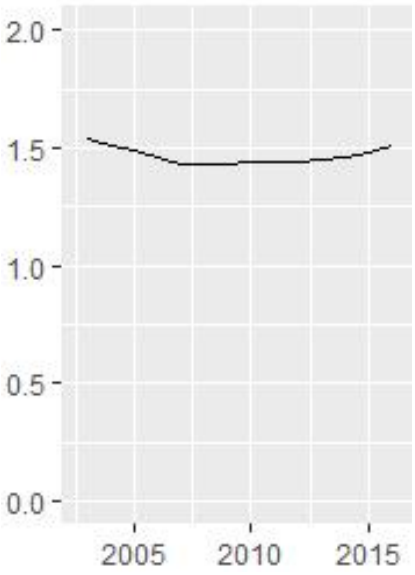
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 2: Farm holders' family workers (in millions AWU) in the EU27



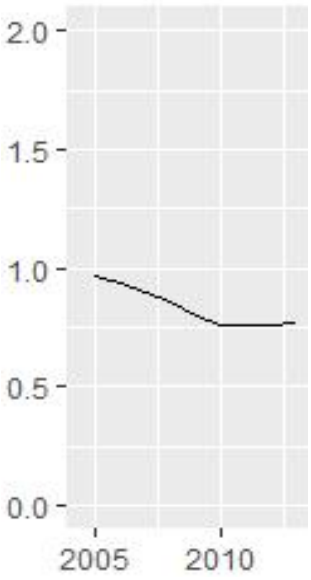
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 3: Regular non-family workers in the EU27



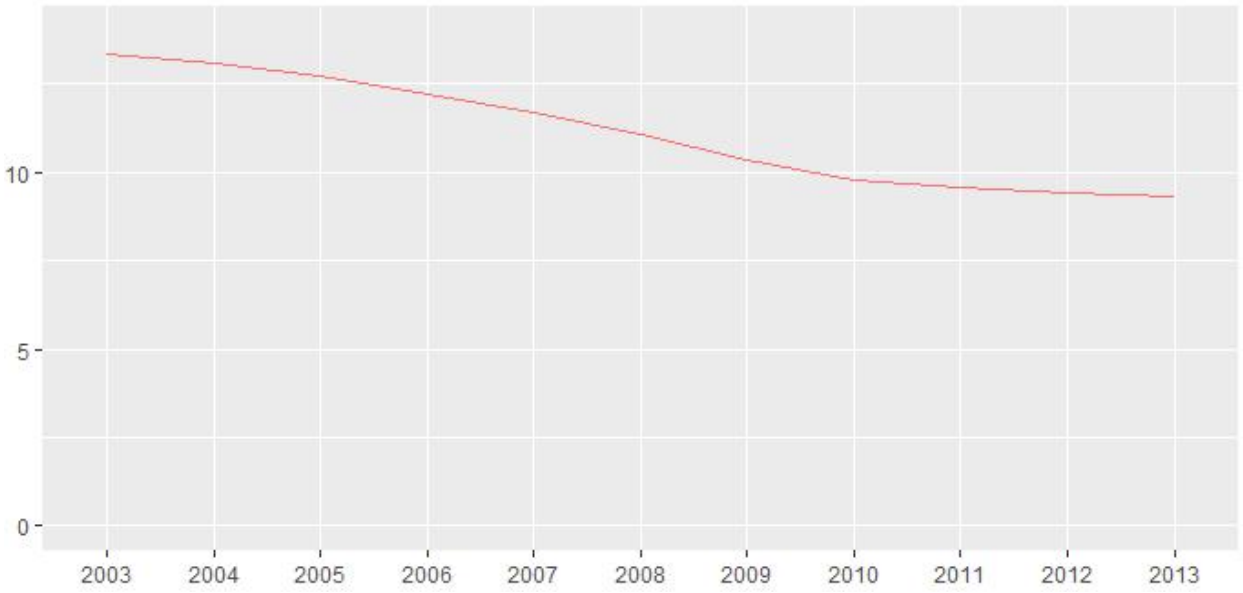
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 4: Non-regular non-family workers (in millions AWU) in the EU27



Source: authors' own elaboration based on Eurostat/CMEF data

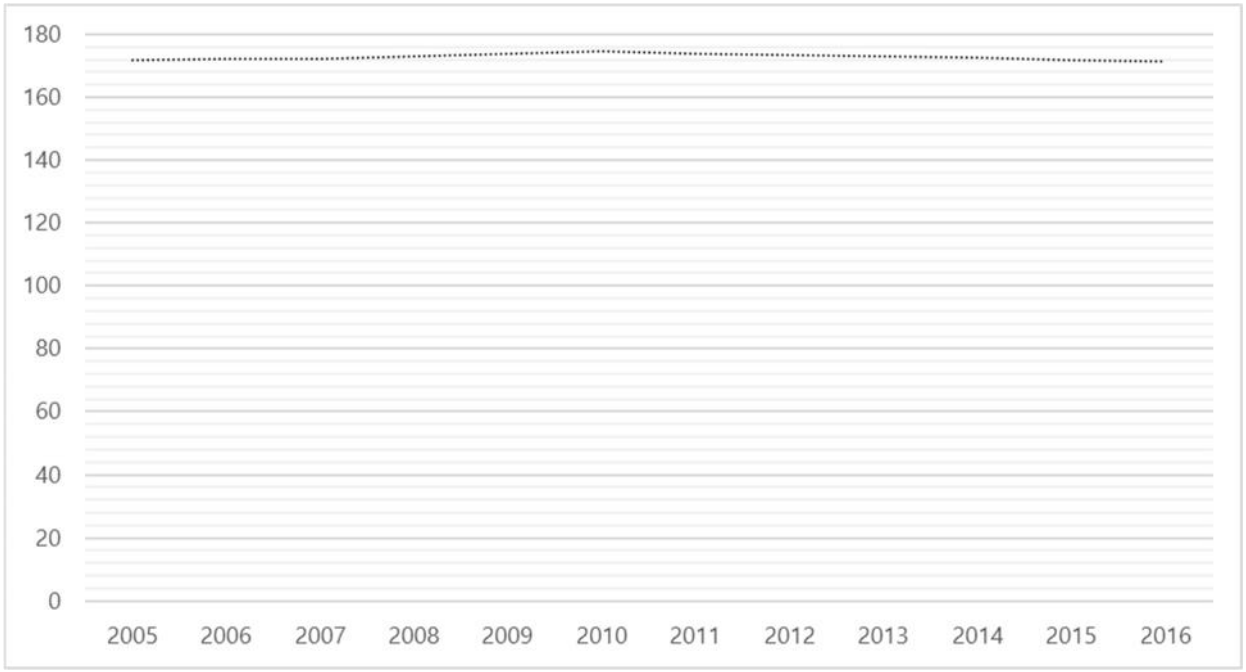
Figure 5: Labour force directly employed by agricultural holdings (in millions AWU) in the EU27



Source: authors' own elaboration based on Eurostat/CMEF data

As illustrated in **Figure 6,** total **utilised agricultural area** has slightly increased between 2005 and 2010 and has been declining since. In 2016, the total utilised agricultural area in the EU-27 was close to its 2005 level (i.e. around 171.5 million hectares).

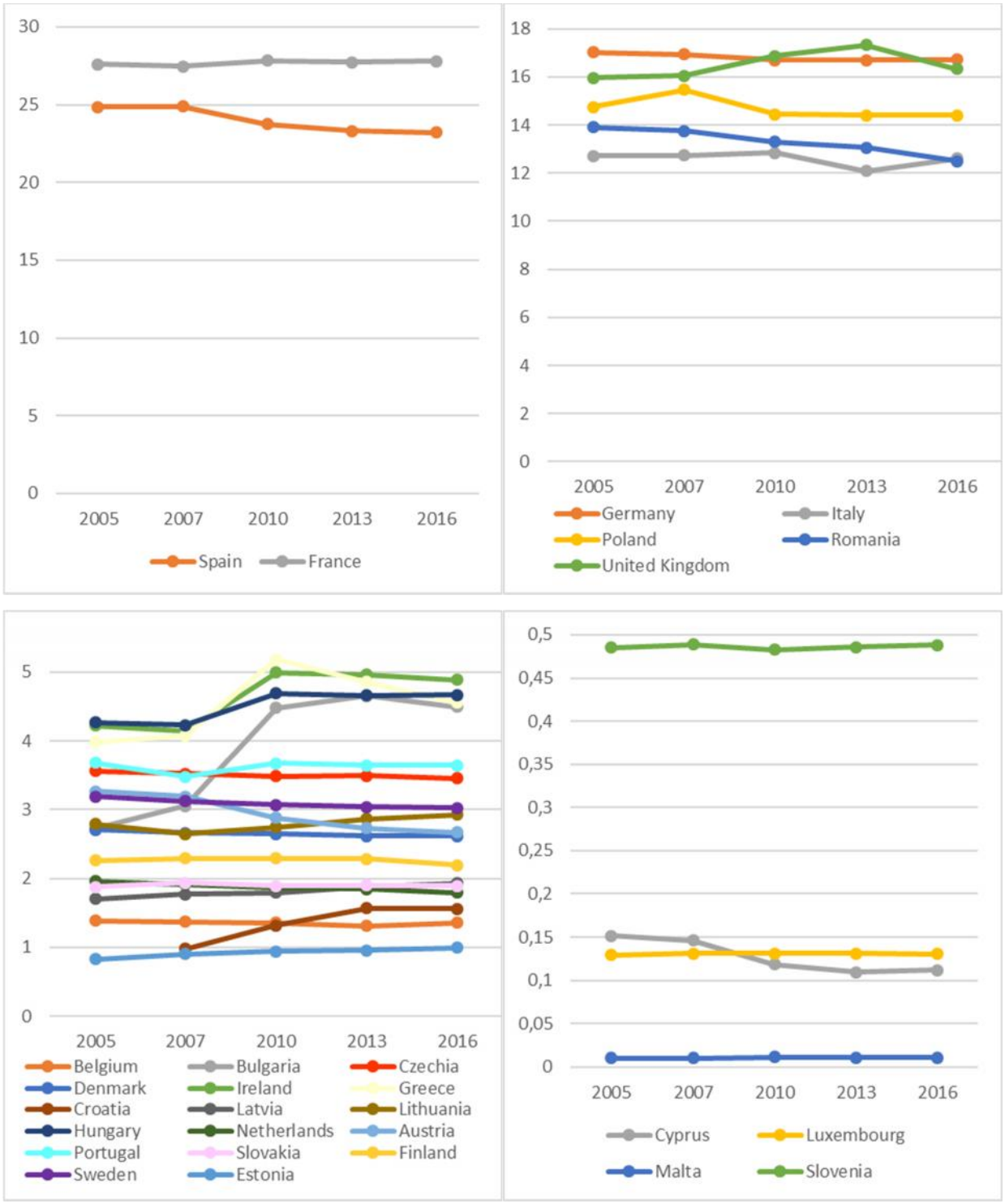
Figure 6: Utilised Agricultural Area in the EU27 (in million hectares)



Source: authors' own elaboration based on Eurostat/CMEF data

Figure 6 illustrates the development of utilised agricultural area on a Member State level. The patterns identified in **Figure 7** show diverging trends among EU Member States as well as fluctuations within EU Member States. Large fluctuations remain nonetheless exceptional, and are primarily to be observed between 2007 and 2010.

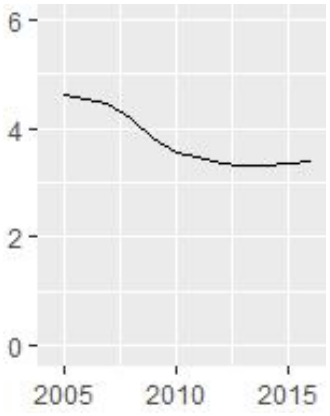
Figure 7: Utilised Agricultural Area in EU Member States (in million hectares)



Source: authors' own elaboration based on Eurostat/CMEF data

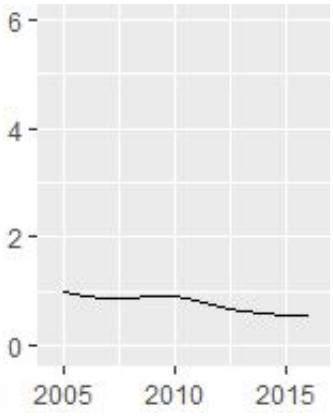
Ageing particularly affects the agricultural sector across the European Union. The figures below illustrate the overall decline in the number of farms managed by young farmers in recent years **(Figure** 9**),** while the number of farms managed by older farmers is stabilising **(Figure 8),** thereby contributing to the structural ageing problem.

Figure 8: Number of farms (in millions) managed by farmers aged 65 and above: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

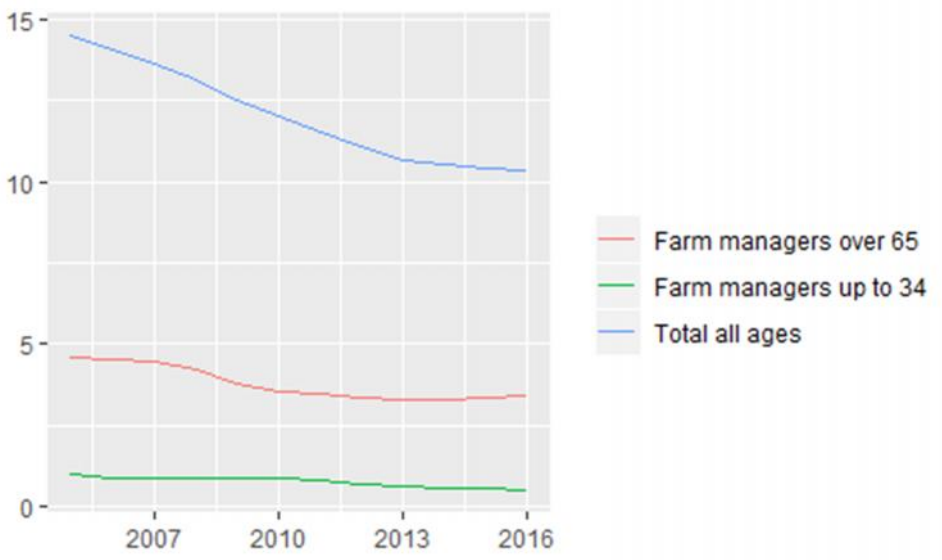
Figure 9: Number of farms (in millions) managed by farmers aged 34 and below: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

In 2005, there were 22 farms managed by young farmers for every 100 farms managed by older farmers, while in 2016 this ratio was of only 16 for 100 **(Figure 10).**

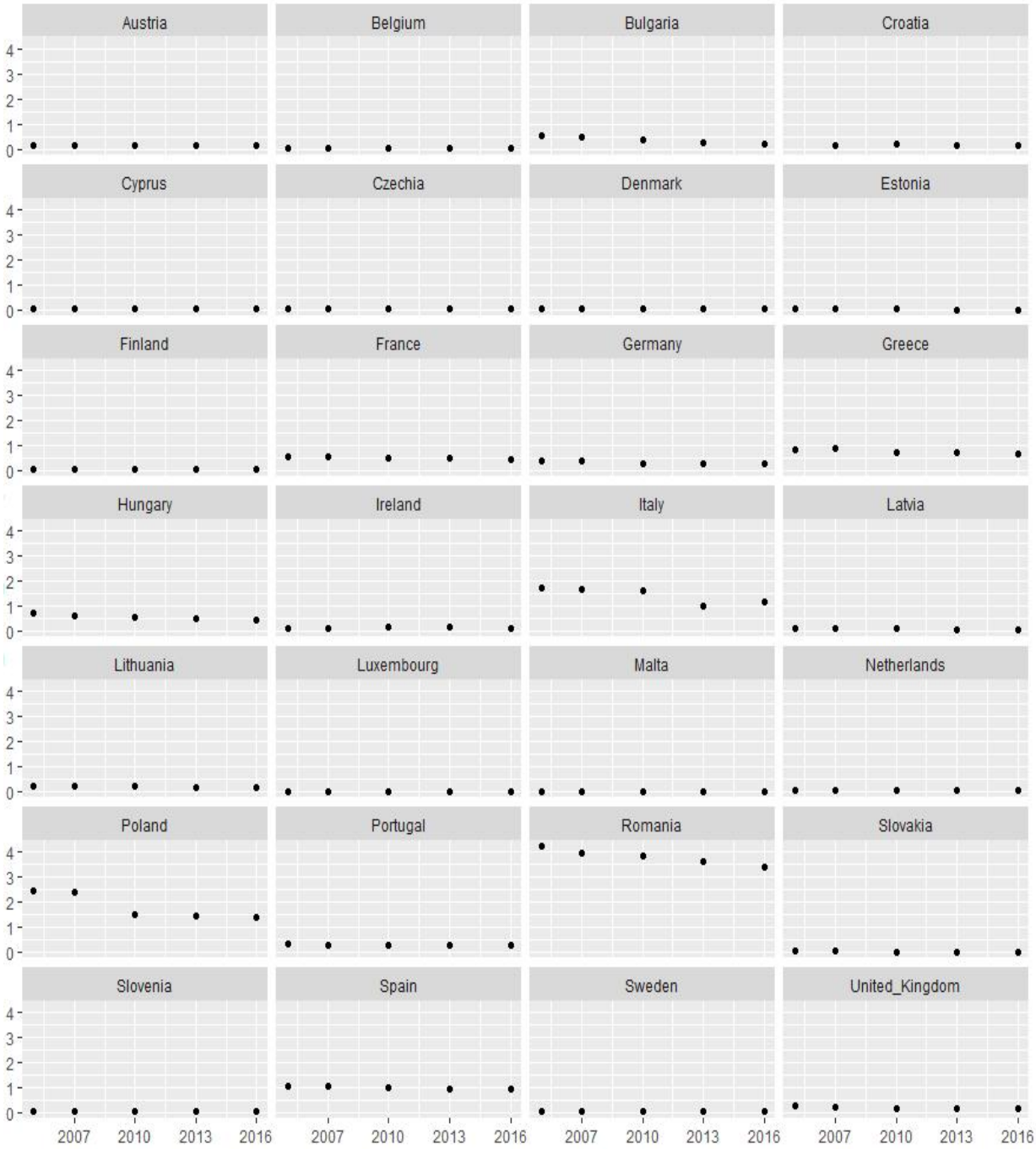
Figure 10: Number of farms (in millions) managed by farmers from different age categories in the EU27: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

The number of farms declined between the early 2000s and mid-2010s across all Member States **(Figure 11),** apart from Ireland which saw a 4% increase in its number of farms. In all other Member States, the number of farms has decreased between 2005 and 2016 by at least 9%, reaching 62% in Bulgaria and Slovakia. This pattern is stronger in newer Member States (in particular Slovakia, Bulgaria and, to a lesser extent, Poland, Latvia, and Lithuania).

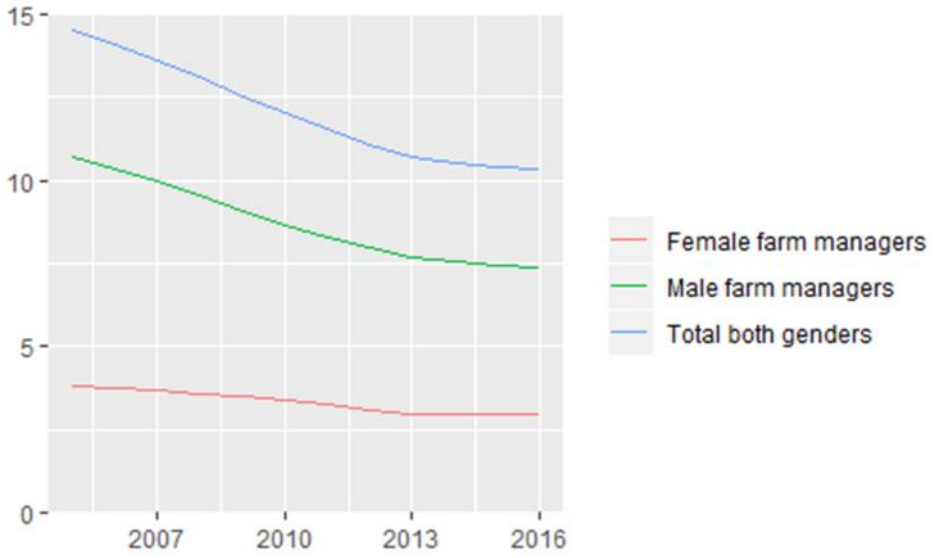
Figure 11: Number of farms (in millions) in EU Member States: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

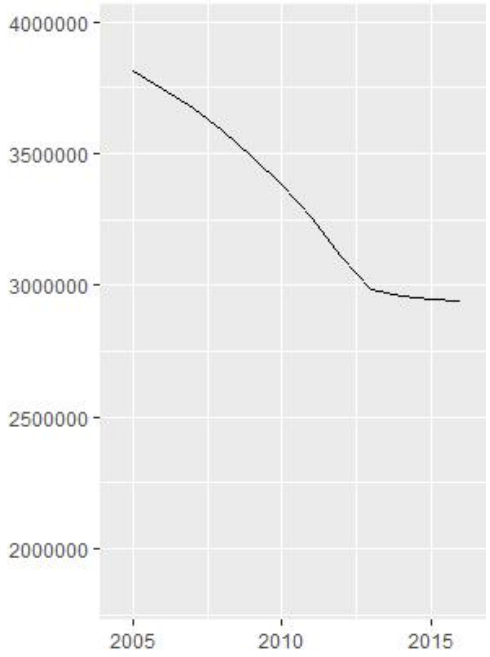
Across Europe, the vast majority of farm managers are men **(Figure 12).** In 2016, approximately **28% of farm managers were women** in the EU-27, a share that has not substantially increased since the early 2000s. The decline observed in the number farm managers applies to both female and male farm managers, occurring mostly between 2005 and 2013 **(Figure 13** and **Figure 14).**

Figure 12: Number of farms (in millions) managed by farmers from different gender categories in the EU27: historic trend



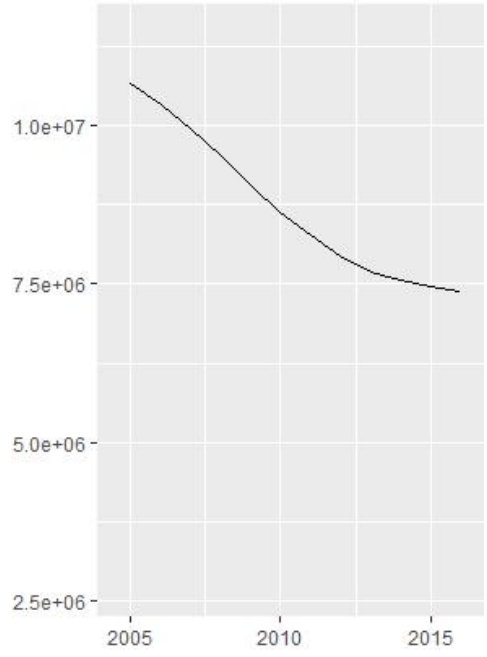
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 13: Number of farms managed by women in the EU27: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

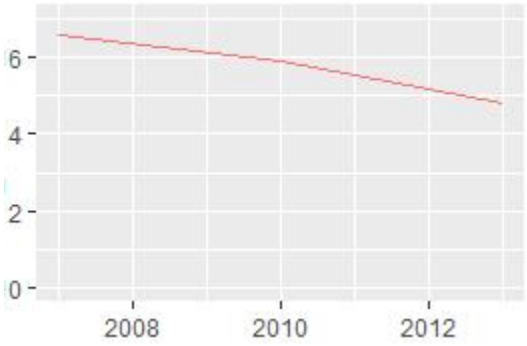
Figure 14: Number of farms managed by men in the EU27: historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

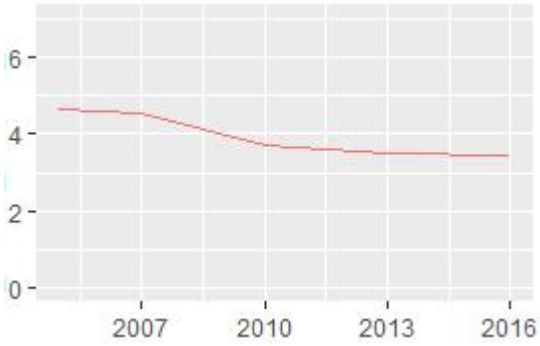
Across Europe (EU-27, discounting Malta) the **number of farms smaller than 100 hectares** has steadily declined since the early 2000s **(Figure 15, Figure 16, Figure 17** and **Figure 18).** This points to significant consolidation occurring in the agricultural sector, as larger farms (with utilised area in excess of 100 ha) have increased in absolute numbers. Farms below 10ha saw the strongest contraction. While medium-sized farms (10 to 50ha) and larger farms (50 to 100ha) also saw declines in absolute numbers, but at a significantly slower pace than small farms.

Figure 15: Number of farms (in millions) of less than 2 hectares in the EU27: historic trend



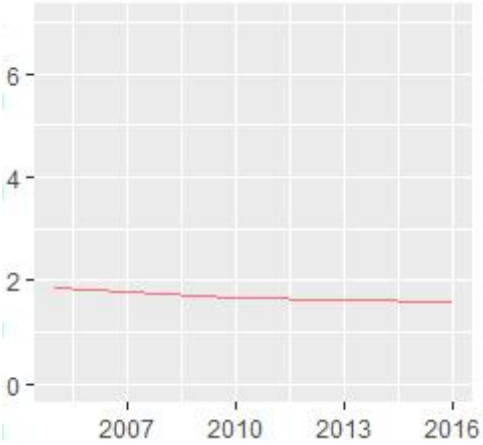
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 16: Number of farms (in millions) of 2 to 10 hectares in the EU27: historic trend



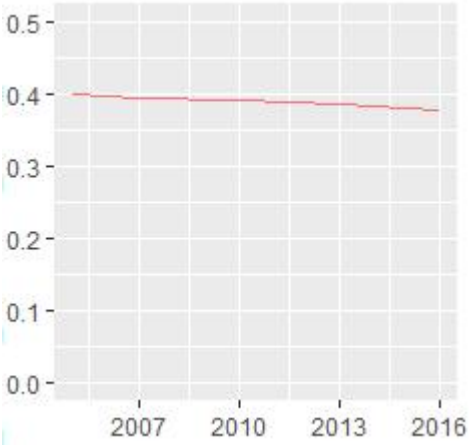
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 17: Number of farms (in millions) of 10 to 50 hectares in the EU27 (except Malta): historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

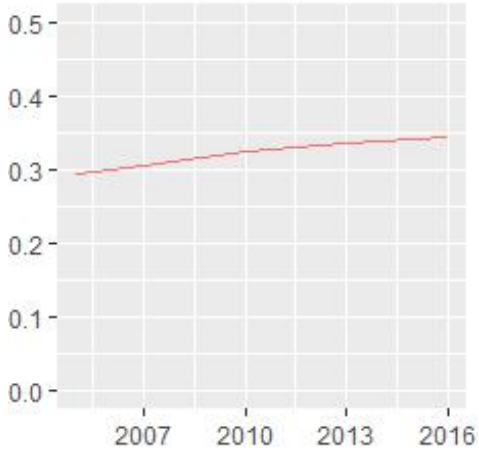
Figure 18: Number of farms (in millions) of 50 to 100 hectares in the EU27 (except Malta): historic trend



Source: authors' own elaboration based on Eurostat/CMEF data

In contrast to the trend observed for farms smaller than 100 hectares, **large farms** (larger than 100 hectares) have been steadily growing in numbers, from 293,000 in 2005 to 343,730 in 2016, representing a 17% increase over this 11 year-period **(Figure 19).**

Figure 19: Number of farms (in millions) of more than 100 hectares in the EU27 (except Malta): historic trend



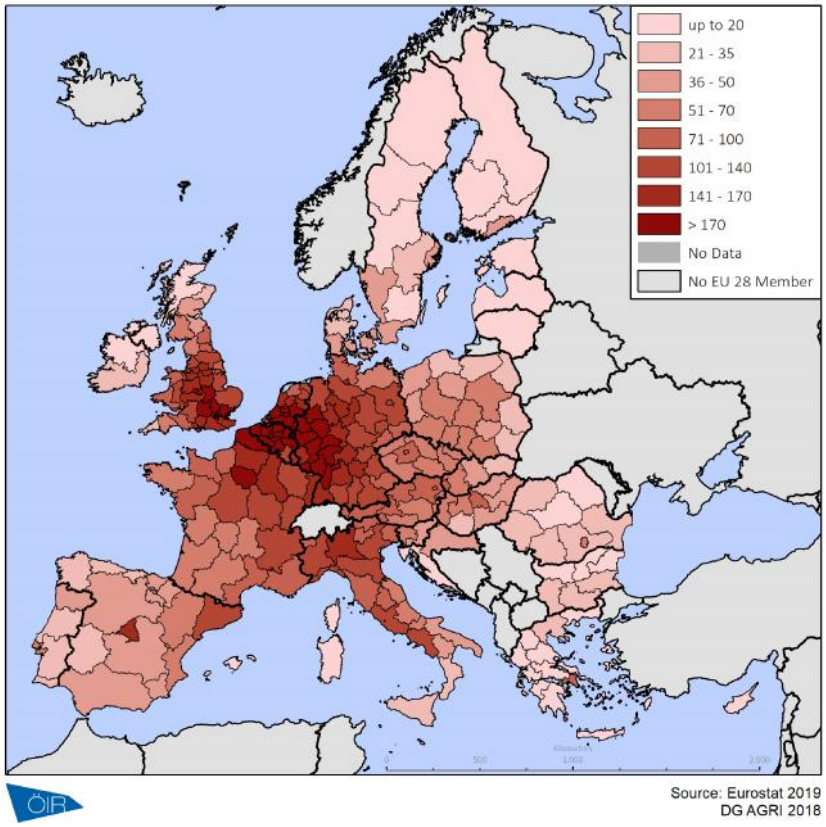
Source: authors' own elaboration based on Eurostat/CMEF data

3.2. EU-wide mapping of current farming employment patterns

More populous urban areas and economic clusters are better connected across Europe than their rural peers. As illustrated in the **Map 1,** road-rail accessibility is significantly higher in the densely populated regions of Benelux, England, north-eastern France, northern Italy and western Germany. Less densely populated regions generally feature lower accessibility, a trend visible across Scandinavia, Finland and the Baltics as well as large parts of Greece. Furthermore, regions in newer Member States also show lower accessibility, with Romanian and Bulgarian regions showing a particularly low score, as do border regions in eastern Poland. In many ways **Map 2** showcases the mirror finding of **Map 1:** densely populated regions with urban-dominated economies feature lower shares of GVA stemming from agriculture. High agricultural GVA shares characterise many maturing regional economies across the European Union, particularly in newer Member States. Mediterranean countries also feature a high GVA share of agricultural activities, as do regions specialised on high value agro-production (e.g. the Netherlands).

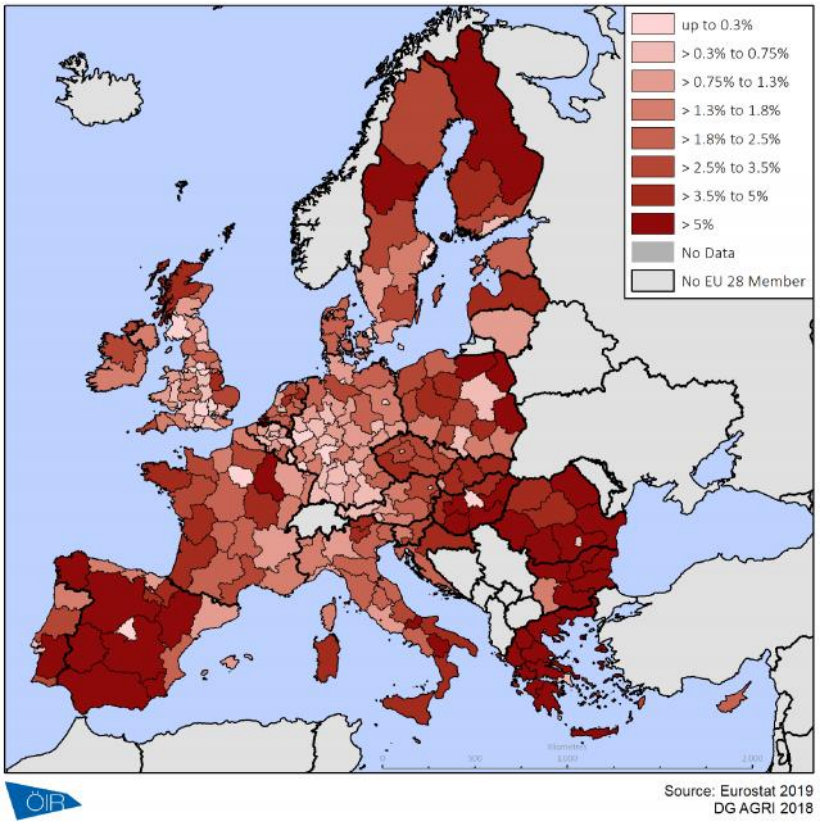
Farmers from Italy, northern France, Germany and the Netherlands belong to the highest-trained farm managers across Europe **(Map 3).** Regions in central Spain feature a lower share of well-educated farm managers, as do regions in Bulgaria, Romania, Greece, Slovakia and Croatia. In general, newer Member States have a lower endowment of well-educated farm managers relative to their total stock.

Map 1: Road-rail accessibility of EU NUTS 2 regions



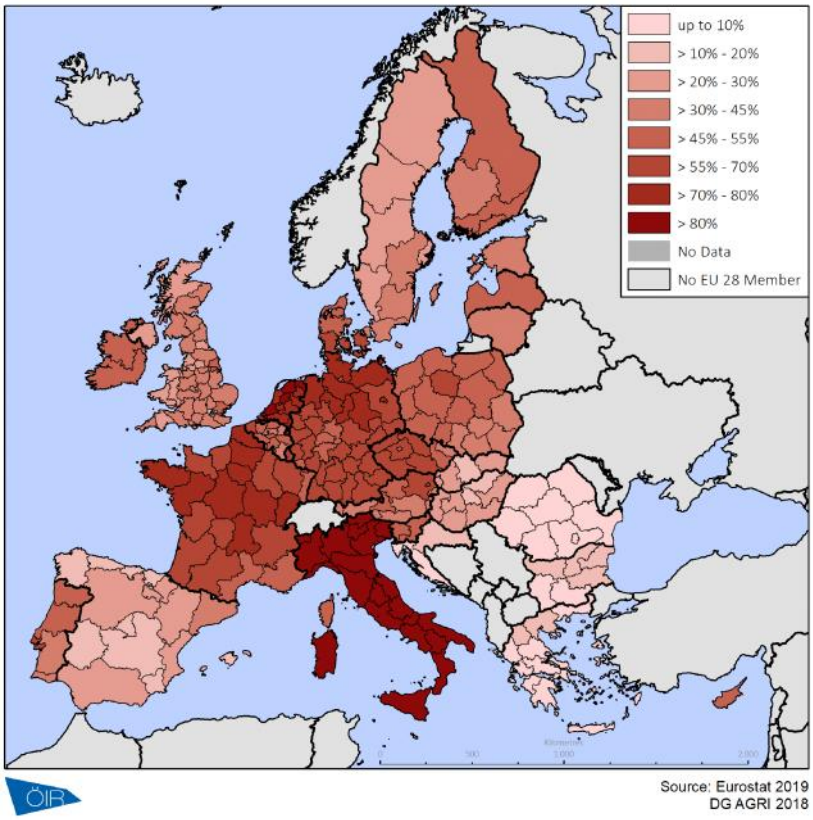
Source: authors' own elaboration based on Eurostat/CMEF data

Map 2: Share of the GVA stemming from agriculture in EU NUTS 2 regions



Source: authors' own elaboration based on Eurostat/CMEF data

Map 3: Share of farm managers with basic or full agricultural training in EU NUTS 2 regions



Source: authors' own elaboration based on Eurostat/CMEF data

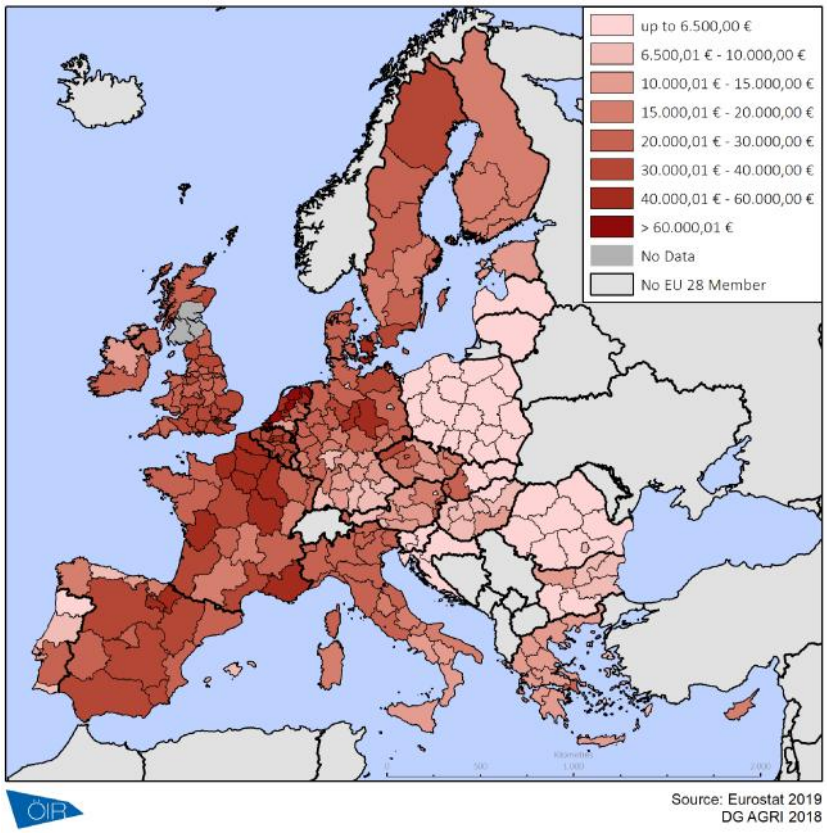
Agricultural income per agricultural working unit is highest in regions with a significant degree of agronomic specialisation (i.e. the Netherlands, see **Map 4).** Generally, high-income regions also feature a higher agricultural income (such as Benelux, the United Kingdom or France). Exceptions are southern regions in Germany, which feature low income per AWU despite being high-income regions. Member States in Central and Eastern Europe are characterised by homogeneously low incomes per AWU.

Family workers are predominantly employed in Eastern European regions, Ireland, Greece, the greater Alpine area and north-eastern Iberia **(Map 5).** French and eastern German regions are characterised by a low share of family workers. This pattern also extends to Czechia and Slovakia.

Map 6 illustrates the share of temporary workers across Europe on a regional scale. Regions with a low share of family workers tend to have a higher share of temporary workers (Eastern Germany, south of Spain, England and Italy) and vice versa (see Poland).

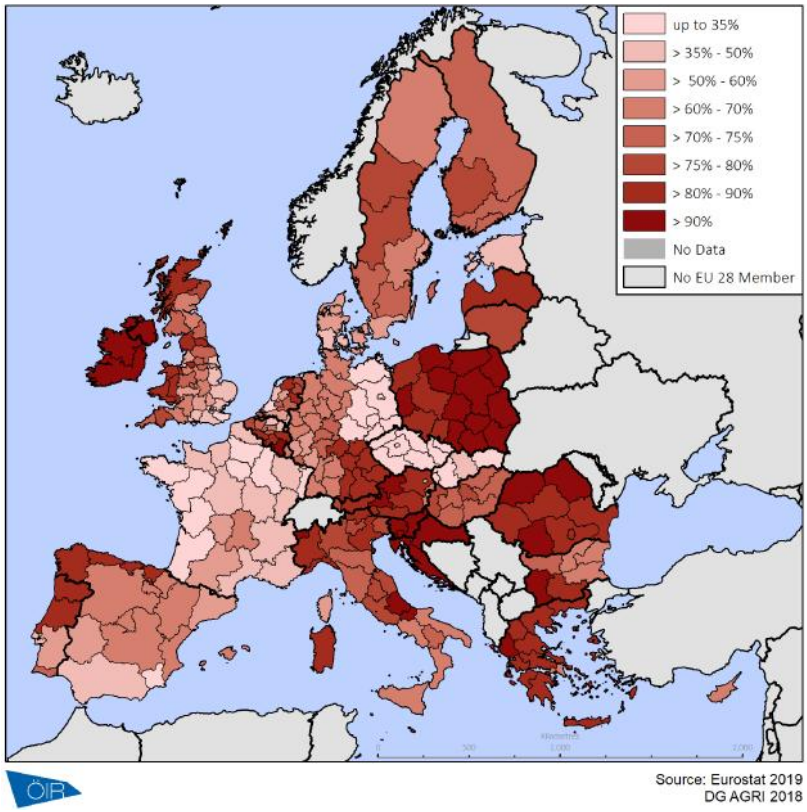
On Member State level the total number of farms has increased by more than 2% over 2010-2016 in two countries only (Czechia and Slovakia, see **Map 7).** A significant number of Member States demonstrate a clear trend towards farm concentration, characterised by stark declines in the total number of farms. Among them are older Member States (Italy, Finland and Netherlands), but also newer Member States (particularly Croatia, Bulgaria, Hungary and Lithuania). On the regional level **(Map 8)** the patterns are relatively homogenous and similar to the ones identified at national level. Few cross-border spill-overs are observed and intra-country heterogeneity is rare.

Map 4: Agricultural factor income per AWU in EU NUTS 2 regions (2015)



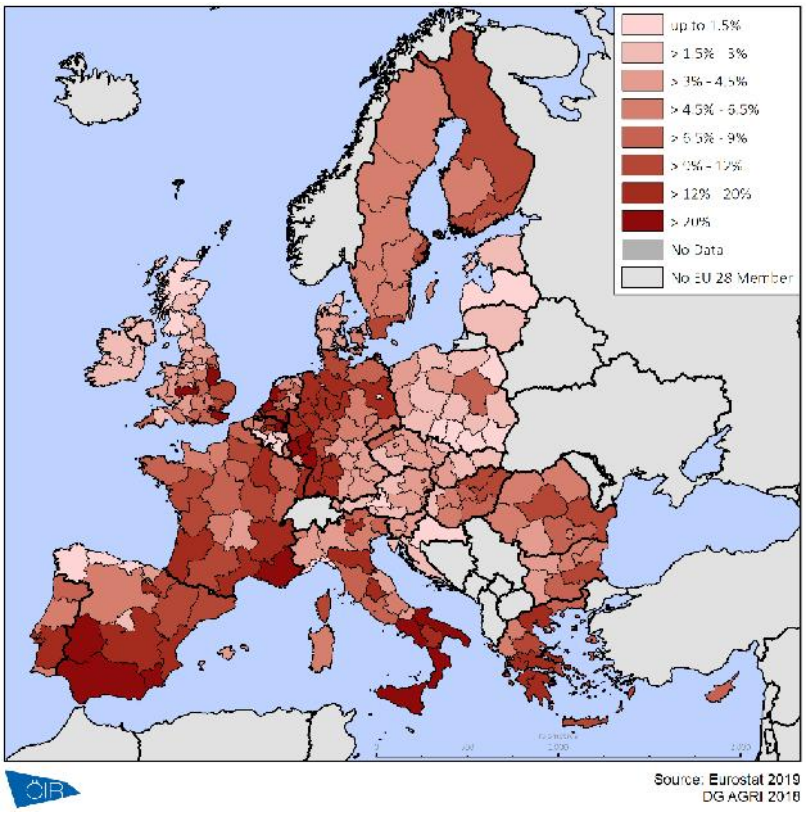
Source: authors' own elaboration based on Eurostat/CMEF data

Map 5: Share of family workers in the agricultural labour force in EU NUTS 2 regions



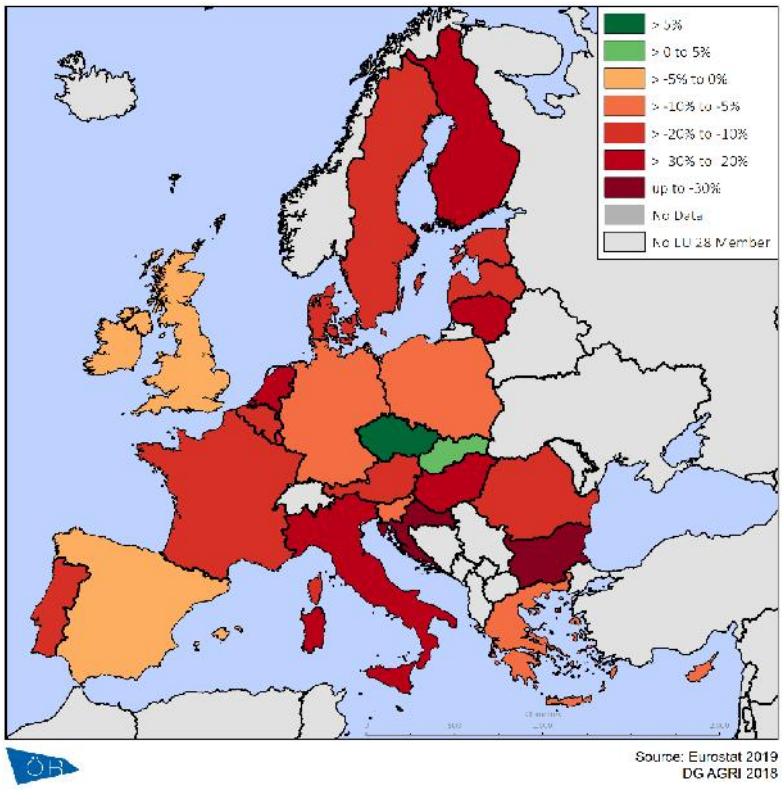
Source: authors' own elaboration based on Eurostat/CMEF data

Map 6: Share of temporary workers in the agricultural labour force in EU NUTS 2 regions



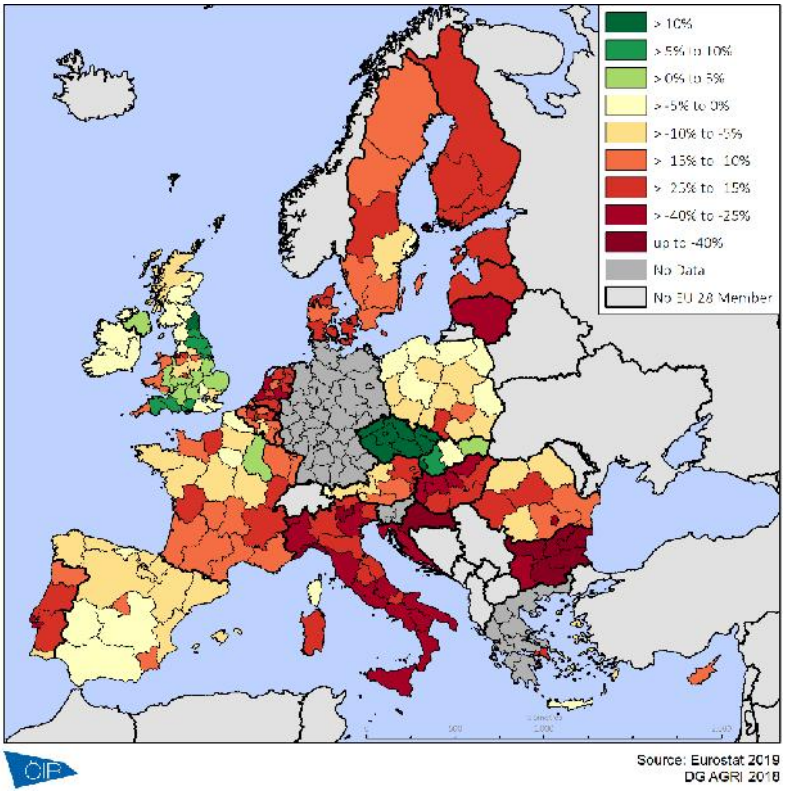
Source: authors' own elaboration based on Eurostat/CMEF data

Map 7: Percentage change in the total number of farms in EU Member States between 2010 and 2016



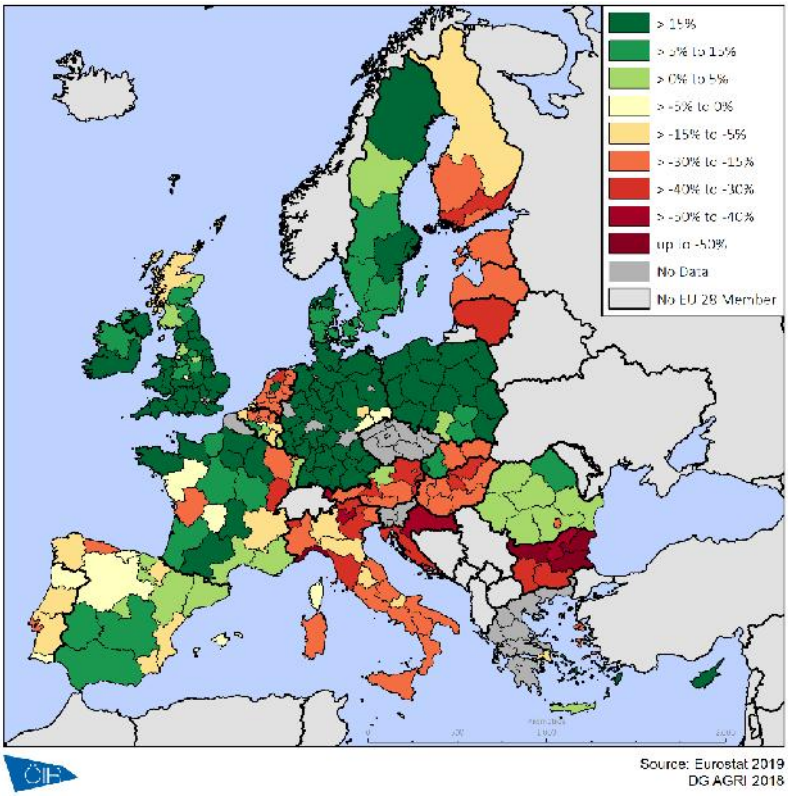
Source: authors' own elaboration based on Eurostat/CMEF data

Map 8: Percentage change in the total number of farms in EU NUTS 2 regions between 2010 and 2016



Source: authors' own elaboration based on Eurostat/CMEF data

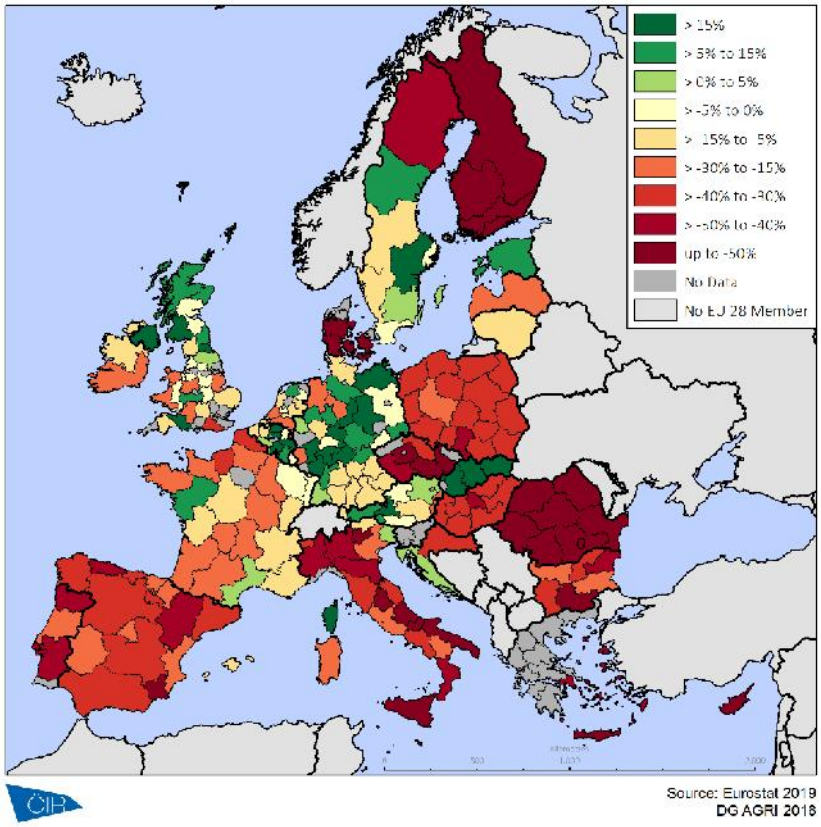
Map 9: Percentage change in the total number of farms managed by farm managers aged 65 and over in EU NUTS 2 regions between 2010 and 2016



Source: authors' own elaboration based on Eurostat/CMEF data

Across Europe, the farming sector is broadly ageing. **Map 9** displays significant increases in the share of farm managers aged 65 and above across the vast majority of European regions. Few countries feature strong decreases of farms managed by older farmers (Croatia, Italy, and Bulgaria). However, in those cases strong contractions in the number of farms can also be observed, hinting towards a significant consolidation. Only a limited number of regions features strong increases in the number of farms managed by young farm managers **(Map 10),** while most regions of Spain, Italy, Hungary, Romania, Bulgaria, Denmark, Poland and Finland have experienced a significant reduction (more than 30% decrease) in the number of farms managed by young farm managers. In the other Member States, these developments are often highly heterogeneous across one country (e.g. in France, Germany, Sweden) and homogeneous across the whole country in only a limited number of cases (Slovakia and Belgium).

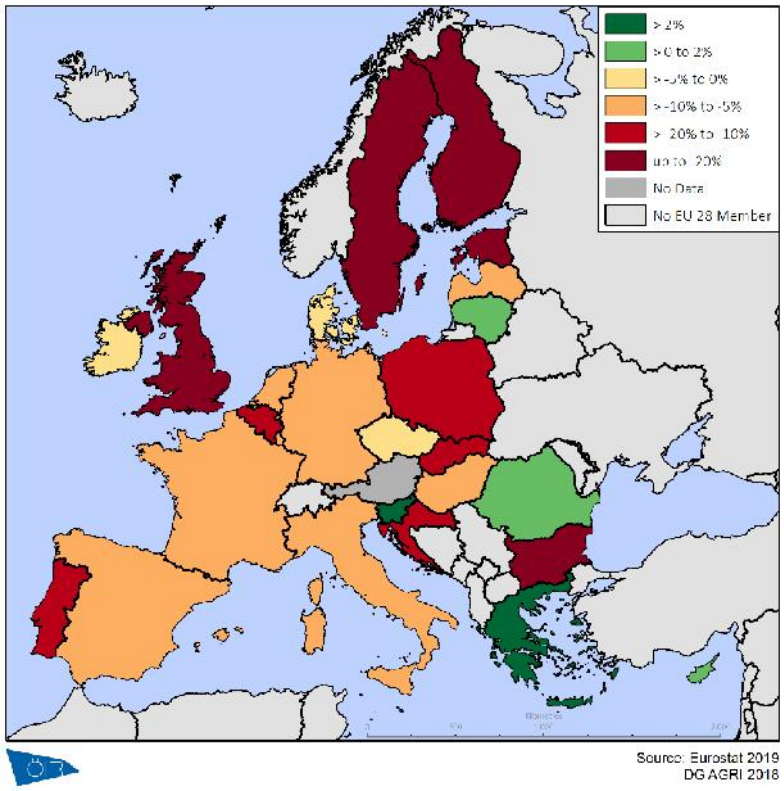
Map 10: Percentage change in the total number of farms managed by farm managers aged 35 and under in EU NUTS 2 regions between 2010 and 2016



Source: authors' own elaboration based on Eurostat/CMEF data

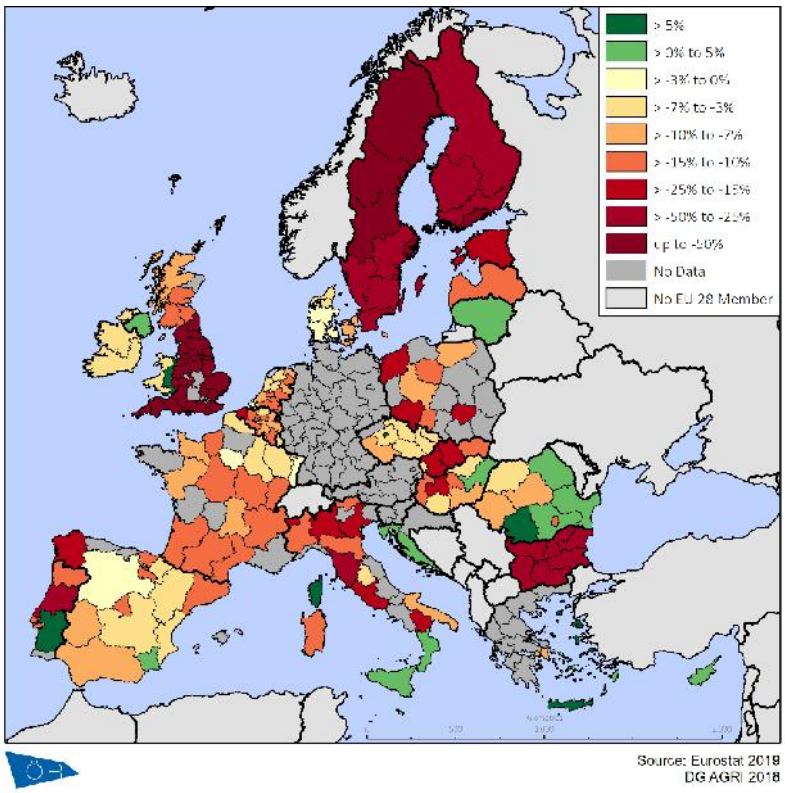
The majority of Member States saw their agricultural labour force contract over the period spanning 2010-2016, apart from Slovenia and Greece (see **Map 11).** In older Member States, these developments were generally slower, with moderate to strong declines across Germany, Benelux, France and Italy. Scandinavia, Finland, the United Kingdom, Estonia and Bulgaria saw the strongest contraction, measuring in at below 20%. On a regional scale, these patterns persist **(Map 12).** A notable exception is the United Kingdom, in which only England faces a significant contraction as opposed to Scotland, Wales and Northern Ireland.

Map 11: Percentage change in the agricultural labour force (directly employed by farm holders) in EU Member States between 2010 and 2016



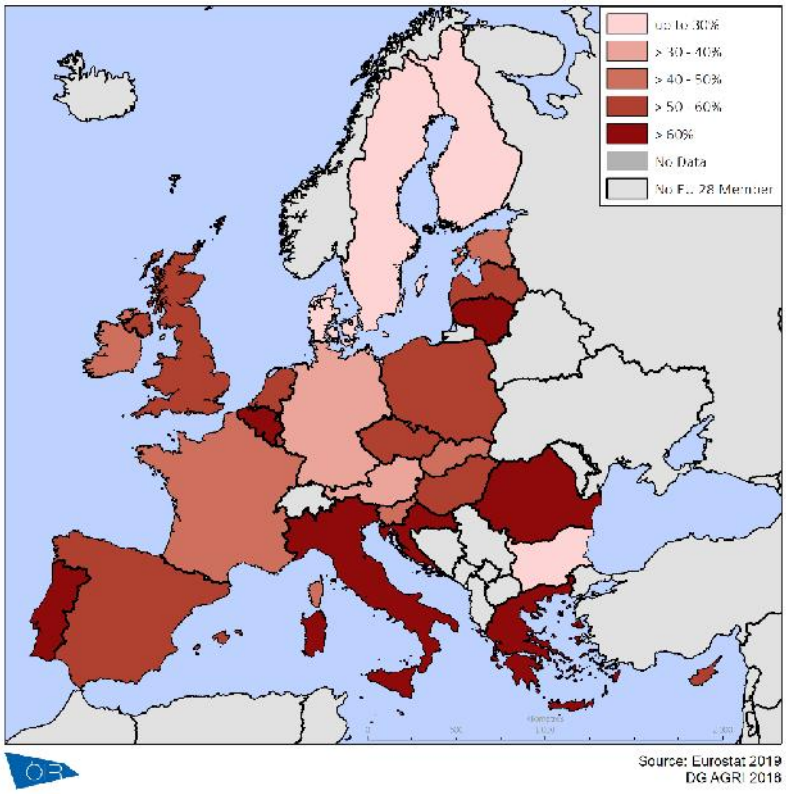
Source: authors' own elaboration based on Eurostat/CMEF data

Map 12: Percentage change in the agricultural labour force (directly employed by farm holders) in EU NUTS 2 regions between 2010 and 2016



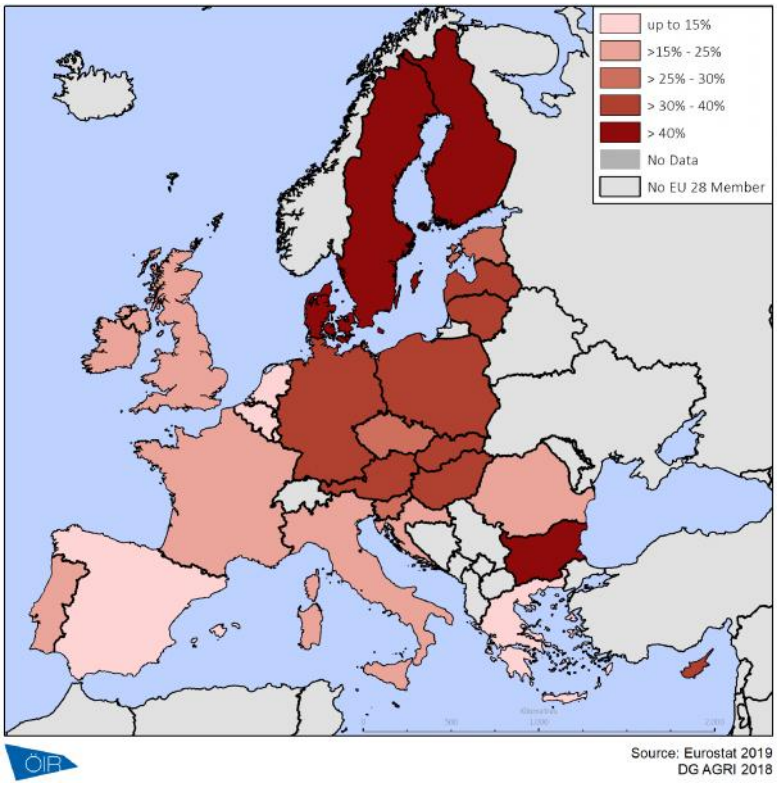
Source: authors' own elaboration based on Eurostat/CMEF data

Map 13: Share of farms whose holder spend no time on other gainful activities in EU Member States (2013)



Source: authors' own elaboration based on Eurostat/CMEF data

Map 14: Share of farms whose holder spend more time on other gainful activities than farming in EU Member States (2013)



Source: authors' own elaboration based on Eurostat/CMEF data

Non-farming related activities are still secondary activities for most farmers across Europe **(Map 13** and **Map 14).** On the whole, the majority of farmers in Portugal, Italy, Greece, Romania, Belgium, the Netherlands, Poland, Lithuania, Latvia, Croatia and Hungary do not undertake any other gainful activities than farming.

On the other hand, farmers in Bulgaria, Finland, Sweden and Denmark are refocusing efforts to other gainful activities.

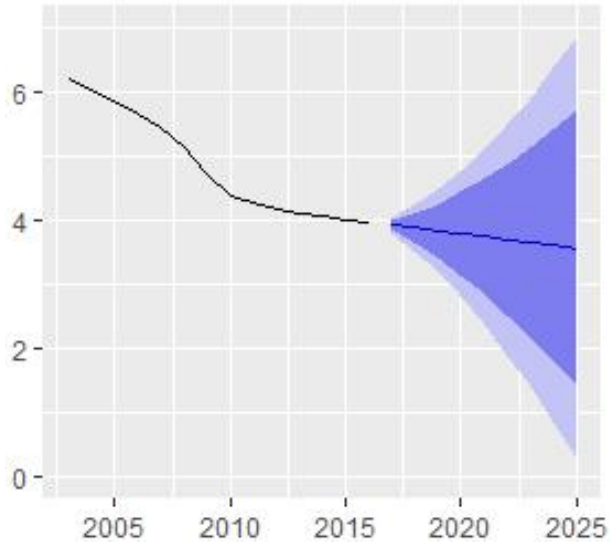
3.3. Forecast estimation of farming employment in Europe and potential developments of the EU agricultural labour market

The application of the ARIMA models allows the researchers in this study to forecast the potential development of several key agricultural indicators. Depending on the available data and its quality, the model allows for accurate forecasting of growth trajectories. Due to underlying data issues, some of the presented estimations carry a lower degree of statistical certainty, as denoted by wider light blue cones.

More precisely, the **light and dark blue cones** in the graph represent the 70% and 95% confidence intervals of the estimation, denoting the possible developments of the variable based on its historic values. This can also be interpreted as possible development paths according to different *"supporting"* or *"hindering"* alternative scenarios of policy action. While the light blue area could represent very unlikely development scenarios (possible only through extreme, or complete absence of, policy interventions), the dark blue area could usually represent statistically reasonable development paths over the next CAP programming period. More technical details on the forecasting models use are presented in **Annex A.2.**

The development of **sole farm holders** is estimated to continue with a slight downwards trajectory (see **Figure 20),** amounting to just above 3.5 million AWU in 2025.

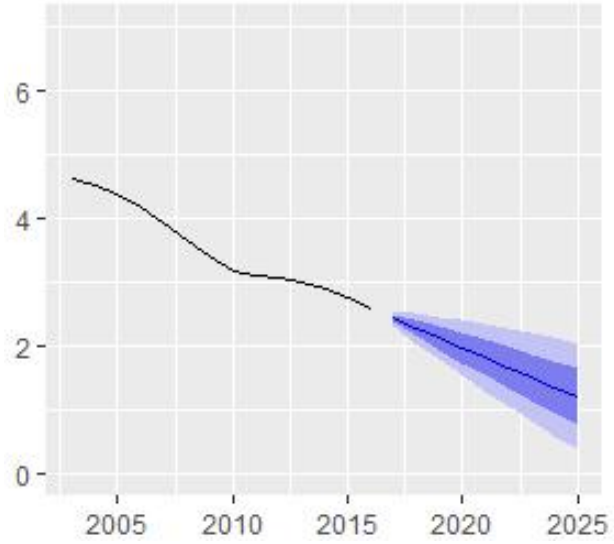
Figure 20: Farm sole holders (in millions AWU) in the EU27: forecast estimation (ARIMA (0,2,1) model)



Source: authors' own elaboration based on Eurostat/CMEF data

The figure below represents the potential development of the number of family workers across Europe. The model forecasts a clear **downward trend,** with a population of family workers in 2025 worth only half of the population in 2016.

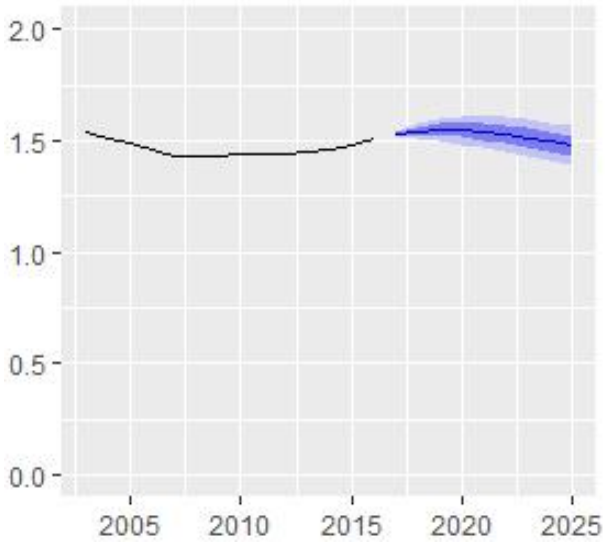
Figure 21: Farm holders' family workers in the EU27 (in millions AWU): forecast estimation (ARIMA(1,1,0) model with drift)



Source: authors' own elaboration based on Eurostat/CMEF data

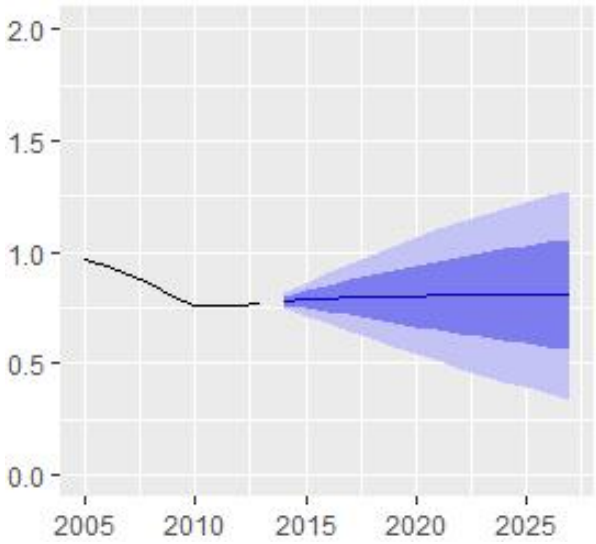
Regular (non-family) farm employment has been increasing since the late 2000s. This trend is unlikely to persist for long, with the model forecasting a statistically significant decline after a peak in 2020 (see **Figure 22).** By 2025, regular employment is likely back at levels of 2015. Employment of non-regular workers (see **Figure 23)** is likely to stabilise on a slowly growing trend. In both cases however, the results of the estimation are not highly significant, thus providing a high degree of uncertainty in regards to future developments.

Figure 22: Regular non-family workers (in millions AWU) in the EU27: forecast estimation (ARIMA(2,0,0) model with non-zero mean)



Source: authors' own elaboration based on Eurostat/CMEF data

Figure 23: Non-regular non-family workers (in millions AWU) in the EU27: forecast estimation (ARIMA(1,1,0) model)

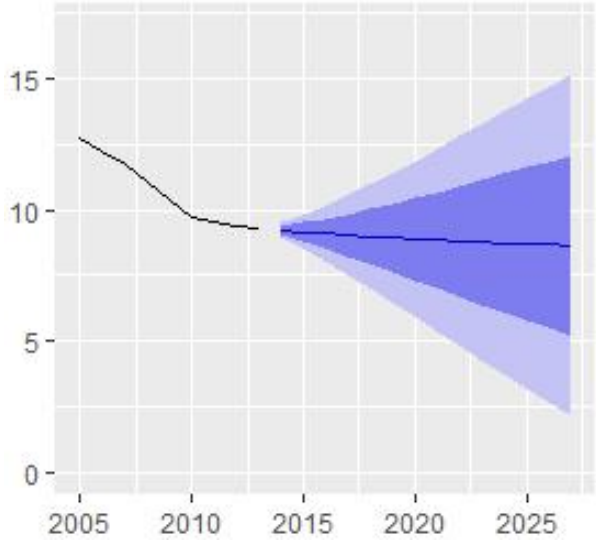


Source: authors' own elaboration based on Eurostat/CMEF data

More generally, the overall labour force employed in agricultural holdings is likely to keep waning in the business-as-usual scenario, though at a very slow pace (see **Figure 24).** In addition, policy

interventions at different governance levels would well accentuate or, on the contrary, revert this trend (see **light and blue cones).**

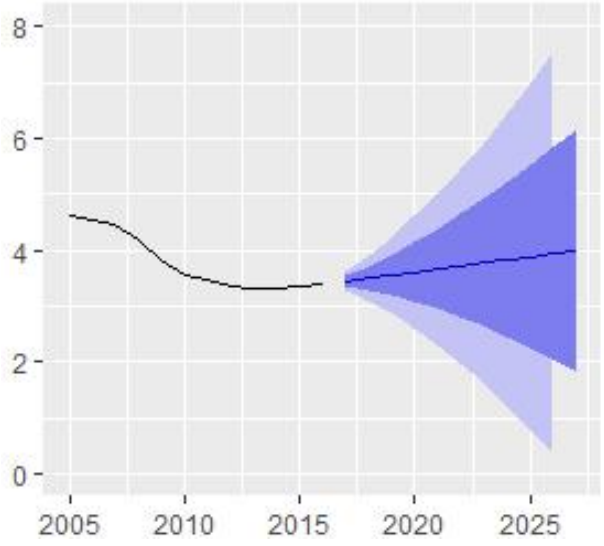
Figure 24: Labour force (in millions AWU) directly employed by agricultural holdings in the EU27: forecast estimation (ARIMA(1,1,0) model)



Source: authors' own elaboration based on Eurostat/CMEF data

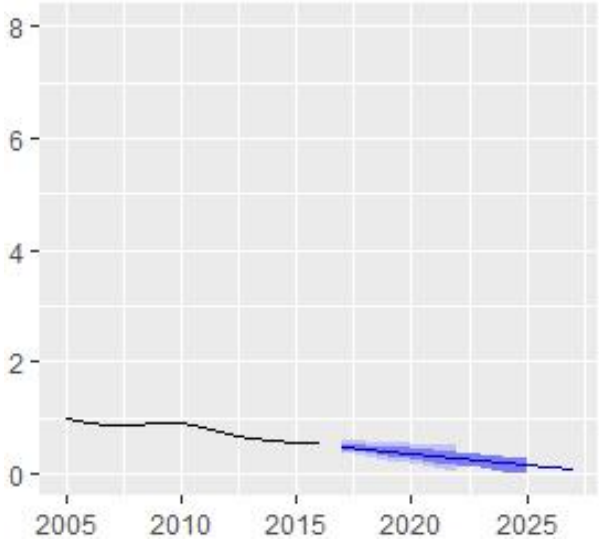
The development path of the number of farms managed by individuals above 64 years remains highly uncertain (as denoted by the wide confidence intervals), with a development trends upwards in the baseline scenario, seen in **Figure 25.** In contrast, the development path of the number of farms managed by individuals below 34 years is negative and more statistically certain (see **Figure 26).**

Figure 25: Number of farms (in millions) managed by farmers aged 65 and above: forecast estimation (ARIMA(0,2,0) model)



Source: authors' own elaboration based on Eurostat/CMEF data

Figure 26: Number of farms (in millions) managed by farmers aged 34 and below: forecast estimation (ARIMA(0,1,0) model with drift)

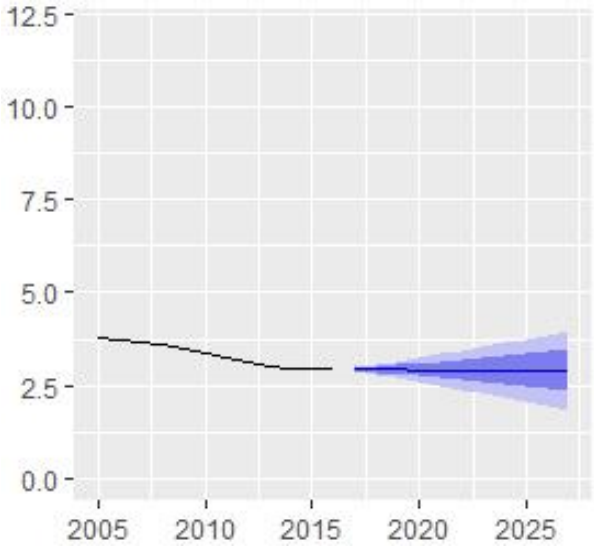


Source: authors' own elaboration based on Eurostat/CMEF data

The number of farms managed by women **(Figure 27)** and men **(Figure 28)** both continue downwards on a slightly negative trajectory across the EU27. However, these results are statistically uncertain, as visible via the sizeable cones.

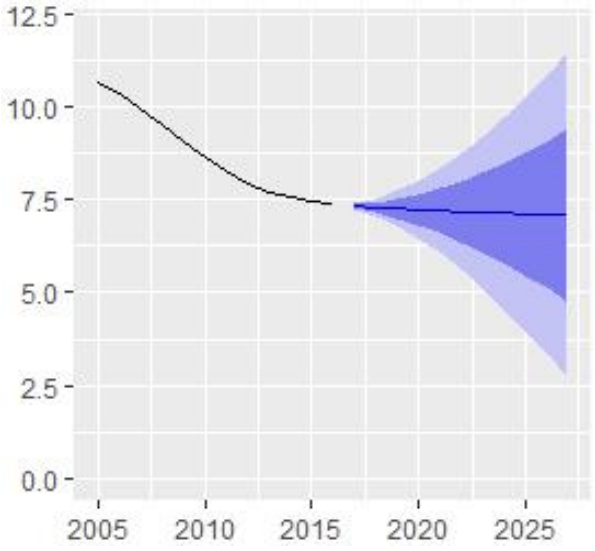
In a similar way, the development of the number of farms in general **(Figure 29)** and small farms **(Figure 30)** continue down a statistically uncertain trajectory. The relatively wide confidence intervals denote a high degree of statistical uncertainty. Large farms (more than 100ha of utilised area) will likely continue growing in numbers at a rapid pace **(Figure 31).** Here again the forecast is statistically certain, as denoted by the narrow cones.

Figure 27: Number of farms (in millions) managed by women in the EU27: forecast estimation (ARIMA(1,1,0) model)



Source: authors' own elaboration based on Eurostat/CMEF data

Figure 28: Number of farms (in millions) managed by men in the EU27: forecast estimation (ARIMA(1,2,0) model)

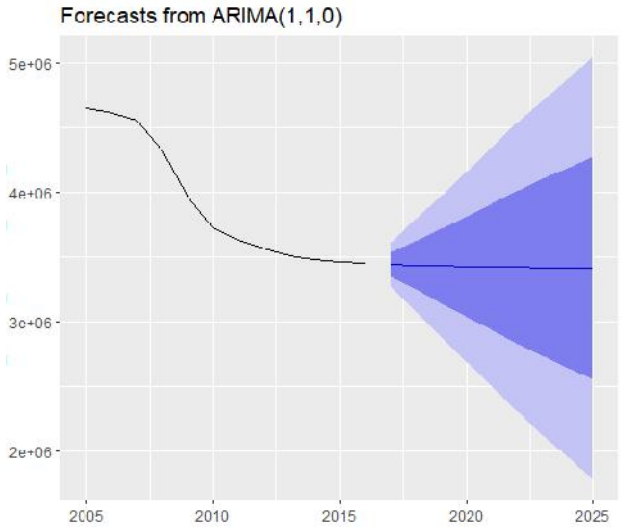


Source: authors' own elaboration based on Eurostat/CMEF data

Figure 29: Total number of farms (in millions) in the EU27: forecast estimation (ARIMA(0,2,1) model)

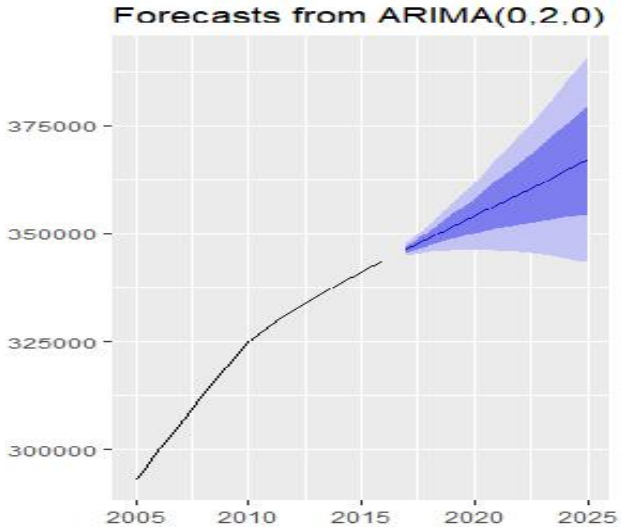
Source: authors' own elaboration based on Eurostat/CMEF data

Figure 30: Number of farms of 2 to 10 hectares in the EU27 (except Malta): forecast estimation



Source: authors' own elaboration based on Eurostat/CMEF data

Figure 31: Number of farms of more than 100 hectares in the EU27 (except Malta): forecast estimation



Source: authors' own elaboration based on Eurostat/CMEF data

3.4. Preliminary conclusions and further comparative analysis

The plots of historic values presented in this Section confirm the general decline in EU farming employment revealed by the literature review (Section 2). In particular, the contraction of the agricultural labour force has been driven by a strong decrease in both farm sole holders' and family workers' numbers (representing more than 75% of the total labour force directly employed by agricultural holdings), hardly offset by the rise of non-family workers (both regular and non-regular) in the last few years. How does the evolution of farming employment and rural living conditions relate to the structure of farms, and in particular to **family farming models** (prevalent in e.g. Poland, Romania and Ireland) and **corporate farming models** with high rates of temporary/migrant workers (prevalent in e.g. southern and eastern Spain, southern Italy and southern France)? In the few regions which saw an increase in their agricultural labour force (e.g. Corsica, in France, and South-West Oltenia, in Romania), are **local strategies** to strengthen the farming sector similar or different?

Likewise, the farm managers' population has been falling sharply in the last fifteen years. Of particular note is the number of farms managed by young farmers, which has almost halved between 2005 and 2016, while that of farmers aged 65 years and above has stabilised in the 2010s. On the other hand, the mapping analysis has shown some regional disparities with regard to structural changes in farm labour force, without any apparent North-South or East-West divide. More generally, **regions with a more rural, less accessible territory** are more prone to rely on agriculture as a source of revenue and growth. At the same time, the more *"isolated"* profile of these regions raises the question of balanced territorial development, quality of life and **attractiveness** of rural areas across Europe. To what extent are farming-oriented regions less appealing to working-age populations, in particular younger generations? How can **institutional frameworks** mitigate this issue, and what kind of **farm-level responses** can we observe in various EU regions? In the many regions exposed to a marked ageing of their farm manager population (e.g. Brandenburg, in Germany, Podlaskie, in Poland and Southern and Eastern Ireland), what development strategies are or should be put in place to favour generational renewal?

Finally, what are the prospects of farming employment in European rural areas, and how can locally-anchored strategies help deviate from a continuous decline forecasted at EU level?

The next section of this study aims at providing, through a series of **in-depth case studies** in selected regions throughout the EU, detailed analytical elements to answer these questions.

4. IN-DEPTH ANALYSIS: CASE STUDIES

KEY FINDINGS

- Across the EU, agricultural regions (defined as those having at least 1% of their GVA stemming from agriculture) feature contrasting farming models, different levels of agricultural training and agricultural income and, more generally, diverse socio-economic contexts.
- Nonetheless, key challenges such as generational renewal in agriculture and the integration of the farm labour force into the wider economy can be found in many regions across Europe.
- Being one of the most important institutional frameworks in place, the CAP – and in particular rural development programmes – plays a prominent role in ensuring the attractiveness and viability of the agricultural sector in European rural areas.

This section covers the case study work performed as part of this study, presenting the process for selecting the case study regions as well as the main results of each of the eight detailed case studies completed. This section is structured around the following three sub-sections:

(a) Regional clustering: what is it used for, how it is realised and which outputs it produced.
(b) Selection of the case study regions for in-depth analysis.
(c) Main results of each case study concerning the main trends, patterns and challenges observed in the regional agricultural sector, and institutional frameworks in place.

A cross-cutting analysis of the case study results along the core topics of this study is presented in Section 5.

4.1. Regional clustering

4.1.1. Clustering principles

Clustering corresponds to the grouping of European cities, regions or countries into a limited number of distinct collections (or *"clusters")* based on their territorial, socio-economic, demographic and/or other thematic characteristics. These characteristics are each represented by a dedicated *"indicator"* (i.e. a quantifiable variable) in the clustering exercise.

Clustering relies on two core principles: **intra-cluster homogeneity** (regions within the same cluster show similarities with regard to their territorial, socio-economic, demographic and/or other thematic profile) and **extra-cluster heterogeneity** (regions from two distinct clusters show different territorial, socio-economic, demographic and/or other thematic profiles). Upon completion of the clustering, each cluster is characterised along the indicators whose values are standing out in the said cluster and its geographic coverage.

The exact number of clusters is to be determined based on the sample size, the number of indicators used, the maximisation of intra-cluster homogeneity and extra-cluster heterogeneity as well as the desired number of case studies to ensure both the comprehensiveness and representativeness of the case study findings. Selecting case study regions from across these clusters will therefore contribute to the validity and utility of case study outputs when synthesizing, cross-checking and concluding on the results of the study.

More details on the technicalities of the clustering exercise are provided in Annex A.3.

4.1.2. Clustering indicators

The territorial level at which the in-depth case studies are carried out (and therefore at which the clustering is conducted) is set at the **NUTS 2 level**[17]**,** for two main reasons: first, it is deemed to best capture the local patterns of agricultural production (due to fairly similar weather conditions and topography across NUTS 2 regions, which is not the case at NUTS 1 and 0 levels); and second, it offers a satisfactory availability of farming-related data (namely from Eurostat and CAP context indicators from the Common Monitoring and Evaluation Framework (CMEF)) for in-depth quantitative analysis of trends (which is not the case at NUTS 3 level).

The clustering exercise planned as part of this study aims at grouping all European NUTS 2 regions based on their territorial, socio-economic and demographic context as well as agricultural characteristics with an emphasis on labour market characteristics. The notion of "territorial, socio-economic and demographic context" refers in this case to the geographic and population profile of the region and its performance against a set of common indicators for social conditions and economic production. The concept of "agricultural labour markets" is defined by a set of key indicators depicting the determinants of agricultural labour markets identified in the previous sections (namely Section 2). The list of indicators used in the clustering exercise is the following:

Table 2: Territorial, socio-economic and demographic context indicators

Indicator	Description	Source	Year	Comments
Share of rural areas	Percentage of predominantly rural areas (of total region area)	European Commission, CCI Indicator C.03	2015	-
Population density	Number of inhabitants per square kilometre	Eurostat	2016	-
Age dependency	Ratio of the population aged 65 and over to the total working age population (15-64 years old)	European Commission, CCI Indicator CCI 2	2017	-
Unemployment rate	Total unemployment rate of people aged 15-74 years old	European Commission, CCI Indicator CCI 7	2017	-
GDP per capita	Gross domestic product (GDP) at current market prices in € per inhabitant	Eurostat	2017	-
Share of people at risk of poverty	Percentage of people at risk of poverty or social exclusion	Eurostat	2017 *(2018 for missing values)*	Data only available at NUTS 0 level for some countries; NUTS 2 values estimated using the net disposable income of households as a proxy.
Rail-road accessibility	Arithmetic mean of the accessibility of motorways index value and the accessibility of railways index value	European Commission's Regional Competitiveness Index based on Spiekermann & Wegener 2016	2014	-

Table 3: Agriculture and farming employment indicators

Indicator	Description	Source	Year	Comments
Share of GVA from agriculture	Percentage of the Gross Value Added stemming from the primary sector (NACE category A)	Eurostat	2016	-

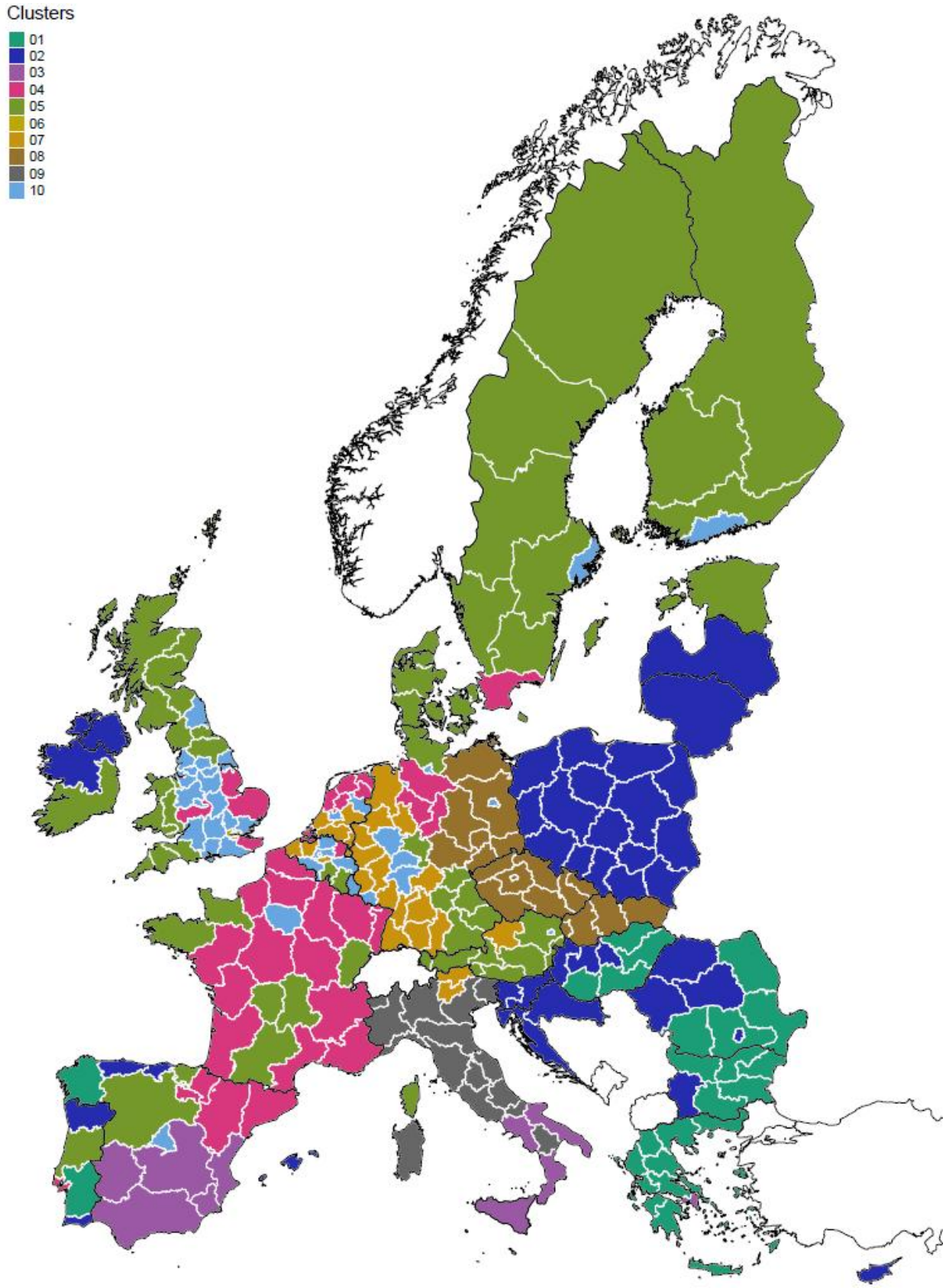
[17] NUTS refers to the *Nomenclature of Territorial Units for Statistics*, a classification which "*generally mirrors the territorial administrative division of the Member States*" (Eurostat).

Indicator	Description	Source	Year	Comments
Share of family workers	Percentage of family workers in total agricultural labour force	European Commission, CCI Indicator C.22	2013	Data only available at NUTS 1 level for Germany; NUTS 2 values estimated to be equal to their corresponding NUTS 1 value.
Share of temporary workers	Percentage of temporary workers in total agricultural labour force	European Commission, CCI Indicator C.22	2013	Data only available at NUTS 1 level for Germany; NUTS 2 values estimated to be equal to their corresponding NUTS 1 value.
Share of farm managers with basic or full agricultural training	Percentage of farm managers having basic or full agricultural training	European Commission, CCI Indicator C.24	2016	Data only available at NUTS 1 level for Germany and for London region (UKI); NUTS 2 values estimated to be equal to their corresponding NUTS 1 value.
Patent applications in agriculture, forestry and fishing	Patent applications to the EPO in the IPC section "Agriculture; forestry; animal husbandry; hunting; trapping; fishing" per million inhabitants	Eurostat	2012	Data only available at NUTS 0 or NUTS 1 level for some countries; NUTS 2 values estimated to be equal to the NUTS 1 (resp. NUTS 0) value of the region they belong to.
Agricultural factor income	Agricultural factor income per AWU (in €)	European Commission, CCI Indicator C.25	2015	Data only available at NUTS 0 level for some countries; NUTS 2 values estimated using the net disposable income of households as a proxy.
Pillar 2 funding under Focus Area 6A	CAP Pillar 2 investment planned over 2014-2020 under the Focus Area 6A "Diversification and job creation"	Rural Development Programmes	2014	For the countries where RDPs are elaborated at other then NUTS 2 level, funding data has been broken down at NUTS 2 level using agricultural employment
Total subsidies per farm	Average total subsidies (incl. CAP Pillar 1 payments but excluding subsidies on investments) received per farm	Farm Accountancy Data Network	2017	For the NUTS 2 regions not matching with the FADN regions, values have been estimated to be equal to the value of the FADN region they belong to.

4.1.3. Clustering outputs

The clustering exercise produced a set of **10 distinct clusters.** The smallest cluster comprises 3 regions and the largest one 55 regions. The clusters are represented on the map below, each cluster being portrayed by a specific colour:

Map 15: Ten clusters of EU NUTS 2 regions



Source: authors' own elaboration

Building on the values (of the means and standard deviations) of the clustering indicators to be found in each cluster, the **10 clusters** can be characterised as follows:

Cluster	Including regions from	Characterisation
1	BG, EL, ES, HU, PT, RO	The lagging regions with low development potential and agriculture as "last resort" of economic activity, characterised by low population density, low GDP/capita, poor accessibility, a low proportion of farm managers with agricultural training and a predominant role of agriculture in the regional GVA; covering mostly Eastern and South-Eastern Europe.
2	BG, IE, ES, HR, CY, LV, LT, HU, MT, PL, PT, RO, SI, UK	The remote regions with traditional, low-income family-based farming models, characterised by a high proportion of family workers and a low proportion of temporary workers in the regional farming labour force, low agricultural factor income, fairly low GDP/capita and poor accessibility; covering mostly North-Eastern Europe, South-Western Europe, parts of Central Europe and European islands
3	EL, ES, IT	The South-Mediterranean regions with unfavourable socio-economic contexts and agriculture as a cornerstone activity to absorb economic downturns and mass immigration. This cluster is characterised by very high unemployment rates, low GDP/capita, high proportion of people at risk of poverty, low subsidies for farmers, a very high proportion of temporary workers in the regional farming labour force and a predominant role of agriculture in the regional GVA, however with wide disparities within the cluster; covering the very South of Spain and Italy as well as the Greek region of Attica
4	BE, DE, ES, FR, NL, PT, SE, UK	The Western regions with highly developed farming systems, characterised by larger farms, more utilised agricultural area under high input intensity and stable farm manager age structure, a very high agricultural factor income per AWU and a high proportion of temporary workers in the agricultural labour force, however with wide disparities within the cluster; covering the majority of France, Northern Spain, parts of North-Western Europe
5	BE, DK, DE, EE, IE, ES, FR, AT, PT, FI, SE, UK	The Northern and Western regions with diverse types of agriculture and farming systems. This is a "residual" cluster covering regions across Northern and Western Europe, including the majority of Sweden, Denmark, Finland, Estonia and Austria as well as large parts of the UK, France and Germany
6	UK	The highly urbanised, non-rural areas from Greater London; covering only three Outer London regions
7	BE, DE, IT, NL, AT	The more urbanised, dynamic regions with an innovative agricultural sector, characterised by very low unemployment, good accessibility and a high number of patent applications related to the primary sector; covering most of Western Germany and parts of Northern Italy, Belgium, the Netherlands and Upper Austria
8	CZ, DE, SK	The inner crescent of Eastern Europe on the path to agricultural intensification, characterised by very high amounts of financial support to farmers, a low proportion of family workers in the agricultural labour force and significant high natural value farmland; covering Eastern Germany, Czech Republic and Slovakia
9	IT	The North-Italian regions with professional, family-based and steady farming models, characterised by a very high proportion of farm managers with agricultural training, a high proportion of family workers in agricultural labour force and overall a very high old-young age dependency ratio; covering Northern Italy
10	BE, DE, ES, FR, LU, NL, AT, FI, SE, UK	The metropolitan, non-agriculture oriented regions of Western Europe, characterised by high population density, high accessibility and a relatively minor role of agriculture in the regional GVA; covering, inter alia, the regions of Brussels, Berlin, Hamburg, Madrid, Vienna, Helsinki, Stockholm, Paris, Luxemburg and most of the southern UK.

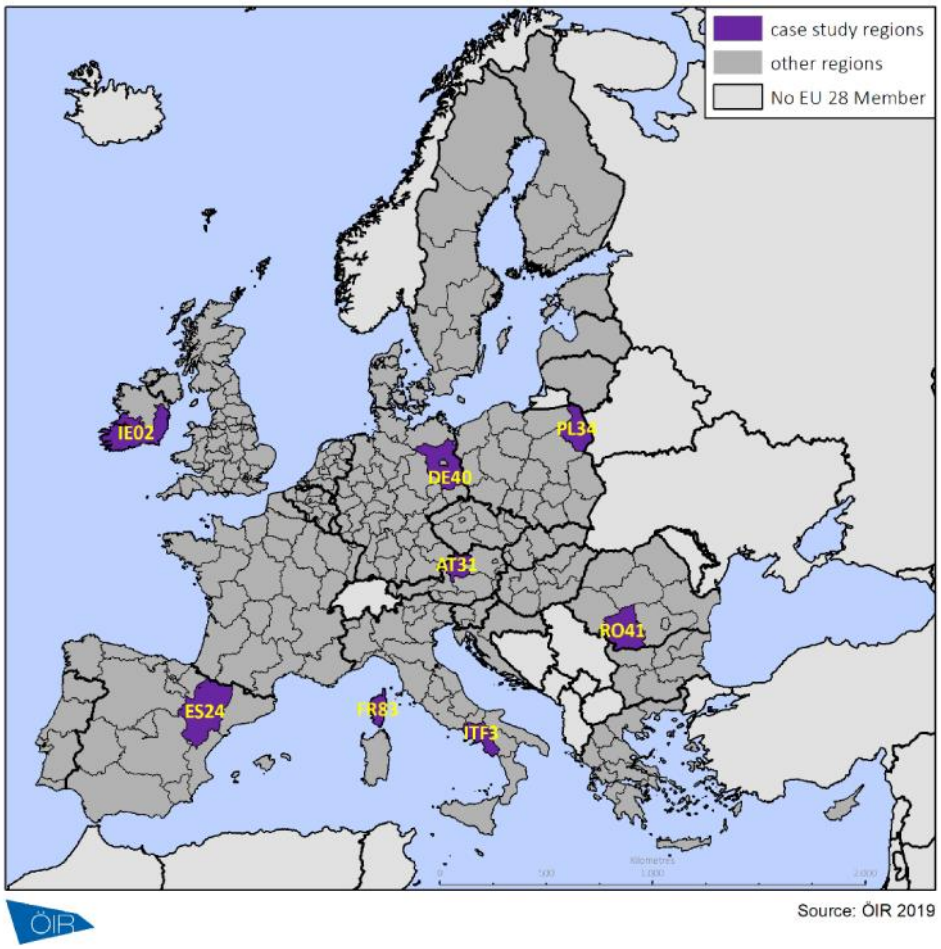
4.2. Selection of Case Study regions

With the aim of selecting a number of regions representative of the European diversity in terms of agricultural types, agricultural labour markets, farming practices and institutional frameworks, this study includes the following NUTS 2 regions and corresponding focus themes for in-depth case study analysis:

Region	MS	Cluster	Focus theme(s)
RO-41 South-West Oltenia	RO	1	Structural changes: family farming model vs. corporate farming model
PL 34 Podlaskie	PL	2	Local agricultural potential and centrally-decided economic strategies
ITF3 Campania	IT	3	Migrant workers and their labour conditions in the agricultural sector
ES24 Aragon	ES	4	Migrant/seasonal workers, their integration into rural communities and the role of the CAP to facilitate their integration
IE02 Southern and Eastern region	IE	5	Generational renewal and new entrants in agriculture
FR83 Corsica	FR	5	On-farm diversification and microeconomic strategies
AT31 Upper Austria	AT	7	Technological development and innovation in farming practices
DE40 Brandenburg	DE	8	Territorial development and generational renewal in rural and sub-urban areas

The case study regions are displayed on the map below:

Map 16: The eight case study regions



Source: authors' own elaboration based on Eurostat/CMEF data

4.3. Completion of eight Case Studies

The completion of eight case studies aims at providing further insights into the drivers of and mechanisms underlying the changes in farming employment observed at EU level. In particular, the case studies focusing on different regions selected across Europe point to commonalities and differences in the observed EU-wide labour market developments and associated challenges, as well as their causes and potential evolution.

Each case study consists of two parts:

- the **first part** presents a wide range of contextual information related to the regional agricultural labour market, namely: different socio-economic aspects of the regional agricultural sector in both qualitative and quantitative terms (gross value added of and employment in the primary sector, agricultural labour force broken down by age and gender, agricultural training of farm managers, pluriactivity and diversification of farming income, etc.); farming employment-related trends observed over the last few years as well as determinants of future employment in the region; major challenges for the regional agricultural sector; and institutional frameworks governing the regional agricultural labour market;
- the **second part** delves into a farming employment-related critical change and/or challenge of particular significance to the case study region, by outlining its drivers, its expected short-to-long term impacts, the strategies in place at regional, national and EU level to mitigate that challenge and any farm-level response to this development.

Full case studies are to be found in **Annex B** (Volume II of this study), while the following sections depict, for each case study region, the most prominent findings from this comprehensive analytical work.

4.3.1. South-West Oltenia (Romania)

(a) Territorial characterisation of the region

The South West Oltenia region is located in the South, South-West of Romania. The region has a population of 2 million inhabitants and a population density of 67 inhabitants/km^2. The region's relief is very diversified, comprising the Danube plain area, the rivers of Olt and Jiu, plains, plateau, sub-mountainous areas and mountainous areas. The climate of the South West Oltenia region is mostly temperate continental, though largely influenced by the Mediterranean climate standards. The largest area of the South West Oltenia region designated for agriculture is in the South, while forested and mountainous areas are dominant in the North.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description	Governance level
National Rural Development Programme (RDP)	Regional Structure (CRFIR 4 South-West Oltenia – *Regional Centre for Financing the Investments, South-West Oltenia):* monitoring, control, contracting and processing payments for the National RDP at regional level; coordinates county level offices.	National/ Regional
	National Structure (APIA – *Agency for Payments and Interventions in Agriculture):* monitoring, control, processing payment claims and payments for NRDP for direct payments and subsidies, handling the Common Market Organisation; coordinates county level offices.	National

Name of the institutional framework	Short description	Governance level
	Regional Operational Programme (ROP) Intermediate Body (ADRSV Oltenia – *Regional Development Agency South-West Oltenia)* at the regional level; manages the implementation of ROP at regional level with regional indicators, allocations and selected measures from the National Programme.	Regional
ESF Operational Programme "Human Capital" (OPHC)	Operational Programme "Human Capital" Intermediate Body (OIR POCU SVO – *Regional Intermediate Body for Operational Programme Human Capital South-West Oltenia)* for the region; manages the implementation of OPHC based on National Programme indicators, allocations and measures.	Regional

(c) Recent trends and patterns in the region, and determinants of future employment evolution

The trends and patterns in the region are heavily influenced by the determinants of future employment: sustained property associated to the farm structure of the agricultural holdings, elderly farmers and the labour force education level.

The configuration of **farm holdings,** as a structural issue in the agricultural sector, has been highlighted throughout the accession transition. This issue spans pre-accession periods and originates from the land restitution process in the 1990s. The repossession process was drawn out and generated fragmented property in an overpopulated agriculture context resulting in numerous small farms. The large number of small and very small properties and farms transform this sector into a subsistence-based social safety net, instead of allowing for the consolidation of medium-sized farms, particularly for young entrants in farming.

The **age structure of the agricultural active labour force** is dramatically unbalanced and dominated by elderly persons concerned over their prospects of retirement. Since no early retirement schemes are provided in the agricultural sector and the pension system is entirely public, the oldest age group prolongs their farming activities beyond the retirement age (65 for men and 62 for women) as farming represents the only viable income generation option. The share of elderly persons active in the farming sector has changed very little over the past three decades, creating a large reservoir of people still in activity.

The **education level** of the agricultural active labour force, among all age and gender categories, can be considered as generally dominated by practical experience only. The low level of professional knowledge and competencies observed is in part due to the elimination of professional and vocational education and training in the EU pre-accession period aiming to increase the number of graduates with tertiary education.

The **corporate agricultural sector** has massively invested in modernisation using all types of financial sources, from private to EAFRD support. New machinery and equipment require qualified labour and superior knowledge, which is difficult or impossible to find on the labour market due to inadequate investments in education and training.

(d) Prevalent challenges in the region

The **demographic change** and population decrease in the region is affected by several wider trends and migration developments at local, national and international levels. A key contributing factor is the absence of an agricultural education sector, furthering the demotivation of potential young entrants and even middle-aged farmers looking to modernise and intensify their production. The current trend is most likely to continue at this pace on the short and medium term considering the present determinants, their importance and influence.

The **absence of an agricultural education system** and the lack of any other type of initiative to meet the demand for agricultural professionals has remained an issue over the past two decades, while the institutional surroundings indicate no improvement. Although the ESF-funded Operational Programme for Human Capital supports interventions in this field, it still does not provide the degree of improvement required to overcome this challenge. The absence of a proper agricultural education sector will further fuel the lack of agricultural professionals. Therefore, this challenge will more than likely increase over time.

The **region's two-speed agriculture** has a high volume of small farms in parallel with corporate agriculture. The recent evolution from 2010 onwards shows an increasing number of small and very small farms representing a significant share in UAA. This structural issue of **"social" agriculture** facing a growing corporate agriculture has an important social dimension linked to rural resilience and mainly based on subsistence agriculture This is an important reservoir of agricultural labour motivated though "trapped" as family labour in small farms, and this issue is likely to remain.

The region does not have a historic cadastre to build on – conversely to regions such as Transylvania and Banat – and no consistent efforts were made until recently to create and consolidate a functional **land cadastre.** This situation leads to extremely long delays in recording the new properties and owners generating confusion and moderation on the land market.

(e) Focus theme: Structural changes – family farming models vs. corporate farming models

The evolution of agriculture beyond Romania's accession to the EU shows that **very small farms** (<1 ha) have been growing in numbers (with a corresponding share of the total number of farms also increasing from 42% in 2010 to 48% in 2016) but represent only 5% to 6% of the total acreage. On the other hand, medium to large farms (>100 ha) represent only 1% of the total number of farms in the region but cover 41% of the acreage. Farms smaller than 5 hectares accounted for 91% of all holdings in 2010 and 94% in 2016. This extended definition of "small farms" (< 5ha) represented 38% of the farming area in 2010, and upwards of 44% in 2016, indicating a large overall share.

This farm structure keeps a **large volume of labour "trapped" as family members** working for the sole holder of the farm, thereby preventing their professional development. The stability of this situation is maintained by the influence of three above-mentioned determinants: (structurally) "trapped" labour, age imbalance and deficient agricultural education, all three creating a feedback loop and being closely interlinked.

Interviews with key stakeholders indicated different levers of action to address this issue, such as further support for **self-employment** in agriculture, further efforts to meet the **need for general and specialised agricultural training/education** and further **protective measures** focusing on family farming for the preservation of local specificities, culture, identity and quality of production.

This places self-employment in the position as the primary focus of agricultural labour development with an accent on education. The reluctance to resort to framework adjustments is linked to previously experienced delays in the implementation of public support. Modernisation of production coupled with more targeted education and training should be in focus to drive further developments in a positive trajectory.

Farm-level responses to these challenges are however still non-existent, due to a lack of long-term vision from farmers, poverty and financial insecurity as well as a widespread scarcity of specialised labour. On the other hand, family farms rely on the "family character" of their small farms, their economic resilience and their capacity to adapt to markets through quality schemes and niche

products – a microeconomic strength which can be built upon to promote rural and regional development.

Policy recommendations to improve the functioning of the regional agricultural labour market and improve the efficiency of employment strategies include:

- Creating a rural jobs register to help employers access information on job history and recommendations from previous employers, to generate confidence and improve the quality of labour generally.
- Implementing a rural youth support measure as part of the National RDP financed in part through the EAFRD and ESF, offering support to young farmers (including through support for investments) with a transversal advantage in scoring higher points for the age criteria in several measures.
- Re-establishing agricultural schools and stimulating the agricultural education market, either as "public services" to society or introduced through incentive for private operators of training/education.
- Offering national/regional adult education and training programmes as an alternative to the middle-aged farmers for completing their professional education and extending their range of competencies, including professional re-orientation.

4.3.2. Podlaskie (Poland)

(a) Territorial characterisation of the region

Podlaskie Voivodeship[18] is located in North-Eastern Poland, at the border to Belarus and Lithuania. The region has around 1.2 million inhabitants and a population density of 58 inhabitants/km^2. It is characterised by flat lands with a large percentage of rural and green areas. It is famous for having Bialowieza Forest, one of the oldest unspoiled European forests, located within its territory. Podlaskie is therefore regarded as one of the least polluted Polish regions with high quality of the environment; nevertheless climate change poses significant challenges for maintaining this status.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
ERDF OP Digital Poland	Farming actors are considered as a potential beneficiary in Priority Axis II: E-administration and Open Government, supported projects include digitalisation of labour market and setting up businesses as means of facilitating access to them.	National
ESP OP Knowledge Education Development	Fostering cooperation between agricultural advisory centres, Local Action Groups and social economy centres.	National
ERDF Regional OP Podlaskie	Direct measures concerned mostly with support of persons leaving employment in farming, however, measures which could be understood as indirectly supporting employment in farming include increasing innovativeness and productiveness and development of agricultural activities, although these are not strongly emphasised.	Regional
Research and Innovation Strategy for Smart Specialisation (RIS3) Podlaskie	Measures indirectly supporting employment in farming include increasing innovativeness and	Regional

[18] Voivodeship (*pl. Województwo*) is a Polish name for a regional administrative unit.

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
	productivity and the development of agricultural activities, agri-food sector.	
Regional Development Strategy Podlaskie	Somewhat in alignment with the regional OP and the RIS3, the development strategy adds focus on development with consideration of the agricultural strength of the region, increasing agricultural exports and innovation in the agricultural and agri-food sector. These measures can impact employment in farming.	Regional
Strategy for Sustainable Development of Rural Areas, Agriculture and Fishing 2030	Explicit support to employment in agriculture-related, pluriactivity and non-agricultural jobs.	National

(c) Recent trends and patterns in the region, and determinants of future employment evolution

Podlaskie is a Voivodeship where the model of **family farms** is still overwhelmingly present and generally favoured (in 2013, family workers still represented 98% of the total agricultural labour force[19]). Rural areas of the region are affected a by poor transport network that further contributes to deficient provision of services of general interest (SGIs). This unfavourable situation is reflected in the continuously decreasing number of residents of the voivodeship in recent years[20].

On the other hand, emerging awareness about the value of traditional professions relating to closeness to nature also results, or can result in, **increased regional identification** and perception of regional and family values. This can determinate more interest in remaining in home places; however, in order to use this potential, living in rural areas has to become more attractive.

The **ever-increasing environmental awareness** leads the society to adopt healthier diets which has an impact on the demand for agricultural food and products. This especially affects organic agriculture which is becoming increasingly popular. Podlaskie Voivodeship recognises its favourable conditions for the development of organic agriculture due to its relatively unpolluted environment.

(d) Prevalent challenges in the region

Sharing general features of Eastern Polish regions, Podlaskie is characterised by a **strong presence of agriculture** (30% of total employment in agriculture) and a weak presence of industry and services, to the point where this economic imbalance poses the challenge of low added value and low productivity leading to overall economic laggardness as well as low level of innovation and entrepreneurship. Economic laggardness further decreases the attractiveness of the region and is an obstacle to exploiting its agricultural potential. In this relatively poor and inaccessible region (by road and rail) with a high unemployment rate, many young people decide to leave rural areas and relocate to cities both within and beyond the voivodeship.

Like many other European regions, Podlaskie is affected by **population ageing** and insufficient generational renewal, particularly prevalent in the agricultural sector. In 2016 for instance, there were 1,680 more farms than in 2013 in the region – a figure hiding an increase of 5,380 farms managed by farmers older than 55 years old and a decrease of 1,240 farms managed by farmers younger than 35 years old[21]. Furthermore, the demographic structure of the region is influenced by both out-migration of its residents, including its qualified workforce (brain drain), and in-migration of (low-qualified)

[19] Source: CMEF CAP agri-indicators.
[20] Source: Statistical Office in Bialystok.
[21] Source: Eurostat and CMEF CAP agri-indicators.

migrants from the Eastern neighbouring countries of the EU. This represents a considerable challenge for the regional transition to a more innovative economy and more attractive agricultural sector, even more so when the region also demonstrates a high degree of incompatibility between the specialisation of its educational institutions (in terms of qualifications) and the labour market.

More generally, the **agricultural policy** in the region is strongly dependant on the EU and national policies. Since the allocation of most of the financial resources are made at national level (e.g. one single Rural Development Programme at national level), the insufficient influence of the region on the regional agricultural policy poses the threat of economic polarization tendencies and further **marginalisation of the region –** in other terms, Podlaskie struggles to find support for making use of its specific strengths such as agricultural potential and environmental quality and is instead "forced" to conform to centrally favoured development trends. In the context of an ominous climate change and its potentially devastating effects on the natural environment, maintaining the regional environmental quality, and in particular its many Natura 2000 sites and protected areas, could become even more problematic without a tailored regional and rural development strategy.

(e) Focus theme: agricultural potential vs. centrally-decided economic strategies

In comparison to other Polish and European regions, Podlaskie's economy is dominated by agriculture, low entrepreneurship and innovativeness contributing to economic laggardness, ageing society and brain drain. In turn, these phenomena all contribute to decreasing the attractiveness of the region, which further translates into a lower interest in farming jobs.

In order to counteract the negative impacts of these developments, regional authorities focus on the **diversification of the economy,** increasing the activities of innovative enterprises but also increasing the innovativeness of traditional sectors. These actions, which are supported both under the regional OP as well as the regional development strategy, most prominently include measures supporting persons who wish to undertake non-agricultural jobs: *"professional activation"* and mobility of persons leaving agriculture including those switching to self-employment and/or setting up their own business.

More generally, the **regional (and national) strategies** and operational programmes focus mainly on productive employment and overall socio-economic development, leading to actions aiming at closing unproductive farms while, at the same time, supporting the further expansion of agricultural activities. In more practical terms, small and unproductive farms (mostly self-employed and family businesses) are encouraged to close and undertake entrepreneurial activities instead (see RDP measure 6.2). Their land is often sold to another farmer looking for **expanding** its activities.

From this perspective, and considering the **region's priority for diversifying** the economy by strengthening the importance of industry and services, generational renewal in agriculture seems to be a topic of lower priority. In reality, the RDP-funded Young Farmer project (a project where persons under 40 years of age receive bonuses for opening agricultural activity or for preparing agricultural products for sale) is considered as relatively popular; however newcomers to agriculture are unlikely to benefit from this financial assistance, as most beneficiaries are children of farmers who inherit land from their parents and use the project to expand their activities, thereby making family farms larger and possibly more productive.

All in all, it is uncertain whether these strategies, programmes and corresponding measures are sufficiently tailored to exploiting the region's potential for strengthening the **regional agricultural identity/tradition** (e.g. by promoting agriculture-related values through the branding of local products and culture, organic agriculture as well as ecotourism – including agritourism) and ownership of agricultural activities through family ties to farms and environmental attractiveness. The

fragmentation of the governance in regards to policies and funds (regional authorities have less financial means at their disposal and can operate to a large extent with soft tools only) adds complexity. Given the current RDP governance set-up, it is questionable whether there is sufficient exchange and coordination between administrative bodies at different governance levels for providing investments tailored to the regional existing strengths and future potential.

4.3.3. Campania (Italy)

(a) Territorial characterisation of the region

Campania is located in the south-western part of Italy, on the shores of the Tyrrhenian Sea to the West, with a population of close to 5.8 million people and a population density of 423 inhabitants/km^2, significantly higher than the national average of 200 inhabitants/km^2. Hills cover more than 50% of the region, followed by mountains (35%) and lowlands (15%). The latter, due to their high fertility stemming from the volcanic nature of the soil, and located near the coastal line, host the major part of agricultural production and count 24 products with a European quality certification (namely 15 PDOs and 9 PGIs). The coastal line is longer than 500 km and 13% of the territory is located on the Tyrrhenian Sea, including its islands (Capri, Ischia, Procida, Vivara and Nisida), which cover just 0.5% of total regional surface. The region's climate consists of both a mostly mild climate, on the coast, and the harsher zone, located in the inner territory, where the mountainous part of the region is.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
Regional Rural Development Programme	With a budget of € 1.1 billion from the EU and € 716 million of national co-financing, the regional RDP focuses on restoring, preserving and enhancing ecosystems as well as on improving the competitiveness of agriculture[22].	Regional
The 2015 European Agenda on migration	Aimed at managing migration, especially across the Mediterranean Sea. Cooperation with third countries mainly concerning return policies, border management, and measures against illegal migration (repressing labour exploitation via the "Employers Sanctions Directive").	EU
Directive 2014/36/EU "on the conditions of entry and stay of third-country nationals for the purpose of employment as seasonal workers"	For responding to the need for seasonal workers in many EU economies and provide a treatment equal to domestic labour force.	EU/National (Member States can impose restrictions on equal treatment).
Regulation 492/2011 ***"on freedom of movement for workers within the Union"***	Setting workers' rights in the EU Member States.	EU
Directive 2004/38/EC ***"on the right of citizens of the Union and their family members to move and reside freely within the territory of the Member States"***	Rights and limitations for EU citizens to move freely within the EU.	EU
Directive 2009/52/EC ***"providing for minimum standards on sanctions and measures against employers of***	Sets sanctions against employers who make use of irregular workforce. It offers citizenship to third-country workers under	EU

[22] Source: European Commission, Factsheet on 2014-2020 Rural Development Programme for Region Campania, available at: https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/country-files/it/factsheet-campania_en.pdf

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
illegally staying third-country nationals"	certain conditions and if they cooperate in the criminal proceeding. It concerns undocumented migrants, only.	
Law No. 40/1998 (Italian Government)	It defines the entry system for third-country workers into the Italian labour market, which relies upon the specific request of labour from a resident employer.	National
Decreto Flussi ("Decree on Flows [of migrant labour]")	It regulates the inflow of migrant workers onto the Italian territory. It consists of a yearly decree in which the number of workers to admit is communicated (total and seasonal workers).	National
"Decreto Salvini" (2018) Law-Decree on immigration and security.	Abolishes residence permits for humanitarian reasons (Decree No. 286/98).	National
2011, Article 603bis of the Criminal Code	Introduces the crime of "unlawful gang-mastering and labour exploitation".	National
Legislative Decree No. 109/2012,	Transposed the "Employer Sanctions Directive" (52/2009/CE).	National
Legislative Decree 2014/24	Transposed the EU Directive 2011/36/EU on trafficking.	National
Law No. 199/2016	Provides severe penal sanctions to gang-masters and employers taking advantage of workers' neediness. Furthermore, it ensures social rights to victims of severe exploitation. Finally, it strengthens the previous *"Network of Quality Agricultural Work (Rete del Lavoro agricolo di Qualità"*, supporting the formation of local branches for better targeted and more active policies to address labour intermediation.	National
Delibera della Giunta Regionale della Campania n. 242 del 24/05/2016 ***"schema di protocollo sperimentale contro il caporalato e lo sfruttamento lavorativo in agricoltura 'cura -legalita' – uscita dal ghetto"***	It builds a solid network of all interested parties to fight illegal labour intermediation and improve migrant labour conditions.	Regional

(c) Recent trends and patterns in the region, and determinants of future employment evolution

Campania, for the period 2000-2016, witnessed an increase in its total Gross Value Added of approximately 30%, that is **below the Italian average rise.** Furthermore, the contribution of Campania's agricultural GVA to the total GVA decreased. Agricultural subsectors such as fruits, vegetables and horticulture represent nearly 70% of the total agricultural GVA, followed by animal products with 11%. Indeed, the latter two sub-sectors featured significant increases of GVA, 22% and 16%, respectively. Other Gainful Activities have a low incidence on the agricultural output, as their shares are roughly one-third of that of Italy. Regional labour force experienced a decline of 35% during the last 16 years, a far higher figure than the national average, (decline of 14%), as well as lower employment levels for 15-24 year-old people. Labour productivity increased significantly in the region (by 120%), doubling the national value. Since investments in fixed assets (an indicator of the competitiveness of the sector) in Campania decreased more than double (i.e. -44%) that of Italy, one can hardly link the increase in labour productivity to mechanisation; instead, this raises some questions about under-reported work in agriculture. In terms of AWU, **non-family labour is increasing** in Campania, especially on a non-regular basis (e.g. seasonal), at the expense of the family workforce, at a faster pace than that at the national level. Campania's wage level lies 30% below the Italian average, despite an increase in the 2004-2017 period, and both **educational attainment and agricultural training** for farm managers are fairly lower than that at the national level. Finally, the weight of **foreign workers,** especially in the southern regions, tripled in 10 years. All these elements suggest that the

farm sector in Campania is facing some challenges amid an important restructuring process. This is characterized by an **increased production specialization,** limited investments and a reduction of the overall labour use. At the same time, the region experienced a growing role of hired and seasonal workers, especially foreigners.

(d) Prevalent challenges in the region

Seasonal and migrant workers are nowadays a structural feature of the Italian job market, especially in the agricultural sector. Labour-intensive and seasonal sectors such as fruits, vegetables and horticulture, and animal husbandry, characterising the agricultural architecture of some Italian regions such as Campania, allows for the use of **migrant workers.** These represent around a quarter of the total hired labour in Italy, reaching three quarters of the total labour force in some areas. Migrant workers have been used to palliate the agricultural labour market gaps (i.e. the shortage of seasonal farm workers threatening the competitiveness of labour-intensive farms), and to reduce production costs. However, the social conditions of migrant workers have been a cause of relevant concern, resulting in forms of human rights violations. The regional farm sector, heavily relying on **labour-intensive and seasonal productions,** is particularly concerned with migrant labour force. The loss of competitiveness of the primary sector and low agricultural wages made the agricultural sector unappealing, especially for young and educated people, posing a generational renewal challenge. Environmental challenges are also present in the region, particularly in regards to **soil contamination** and climate change. The former relates to the irregular disposal system for toxic waste that affects some areas of the region (in the provinces of Naples and Caserta), contaminating the soil and underground water, and eventually contaminating agricultural productions. Regarding **climate change,** specific regional productions (e.g. DOC wines) have already been affected through unpredictable hail, high temperatures, droughts, spring frosts, changing the way of farming and the quality of agricultural products. Finally, **socio-economic challenges** are also affecting this territory. One key concern is indeed related to the uncertainty surrounding the Brexit: a no-deal would mean a significant loss for the agricultural economy of Campania, with its exports to the UK representing 12.5% of regional agricultural GVA.

(e) Focus theme: migrant workers and their labour conditions in the agricultural sector

In Campania, the relative importance of migrant workers increased, especially for labour-intensive farms with a high demand for seasonal work. The inefficient and complex system of labour recruitment generated a rupture between demand and supply, allowing for illegal intermediaries, the *"caporalato"*. This is often linked to gang-masters and results in exploitation of human beings and human rights violations, even when migrants are regularly employed. Campania's agricultural labour force hosts around 30% of **informal agricultural workers,** and around 50% of farm workers receive a wage far below the minimum wage stipulated on a regional and/or national level, especially foreign workers. Since the migrant's visa is formally bound to a signed labour contract, they find themselves in a very vulnerable position with respect to employers.

In terms of migrant profile, Campania features a tremendous increase in Asian workers, to the detriment of Eastern workers not belonging to the EU, mainly Albanians. At the same time, foreign labour force coming from the EU-28 demonstrates a steady presence at regional and national levels, especially Romanians. Migrant workers tend to specialise by gaining specific skills and knowledge: in Campania, foreign workers represent a relevant share of hired workers in farms specialized in grazing livestock, arable and mixed crops. The presence of migrant workers increases with the farm size, providing around 25% of the worked hours in large units, but just 9% in small ones. Farms employing foreign workers receive an overall CAP support per worker that is half of those not hiring any migrant.

This suggests reflecting on the conditioning of the CAP payment to the fulfilment of adequate labour conditions requirements, as farms may decide not to comply with rules related to labour conditions whenever the foregone public support is lower than the benefits they obtain. **Policy recommendations** in that regard therefore suggest implementing some kind of **"social conditionality"** for CAP payments by explicitly referring to the fulfilment of labour rights and minimum standards, relying on *"congruity indexes"*[23]*:* a system defining the relationship between the quantity and quality of goods and services offered by employers and the number of hours worked, useful to identify potential irregularities within farms and suspend CAP payments whenever irregularities are found.

Moreover, extending the role of Rural Development Programmes in regards to the implementation of LEADER projects through **Community-Led Local Development** (CLLD) (especially for measures 16.9 and 19) appears necessary for the pursuit of social integration and fostering good living conditions. At the national level, there is a need for developing an efficient and **lawful system of intermediation** between the employer and the employee, reconsidering the body of laws concerning immigration and improving law enforcement by raising the number of inspections. Besides, it seems advisable to encourage participation into the *Network of Quality Agricultural Work* by making it attractive from an economic point of view. Finally, it could be useful to envisage an **information campaign** targeting both the society and functionaries of the public offices regarding migrant worker conditions.

4.3.4. Aragon (Spain)

(a) Territorial characterisation of the region

Aragon is an Autonomous Region located in the North-East of Spain, bordering France, and is composed of three provinces: Huesca, Teruel and Zaragoza. The region has a population of 1.3 million inhabitants and a population density of only 27.5 inhabitants/km^2, far below the national average of 92.6 inhabitants/km^2. There are only three municipalities with more than 30,000 inhabitants, and the rest of the territory gathers 42% of the population on almost 97% of the region, which results in a rural population density of as low as 11.62 inhabitants/km^2. The rural areas of Aragon suffer, for the most part, from a **high degree of ageing and serious risks of depopulation.** It is a mountainous area, with more than 40% of the territory being located at an altitude of more than 1,000 metres.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
Aragonese Institute of Employment, INAEM[24]	Execution of the active employment policies at regional level: intermediation of the labour market: contacting job offers with workers seeking employment; planning, management and control of employment policies (programmes to support and promote employment; employment workshops); vocational training for employment: Aragon employment plan.	Regional (under national coordination)
National Employment System	Coordination of active employment policies and execution of part of them, also in collaboration with other entities.	National (in collaboration

[23] As introduced by the recent law of the Latium region "*Disposizioni per contrastare il fenomeno del lavoro irregolare e dello sfruttamento dei lavoratori in agricoltura*" (*Provisions to combat the phenomenon of irregular work and the exploitation of workers in agriculture*) (Consiglio Regionale del Lazio, 2019).

[24] https://inaem.aragon.es/funciones

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
SEPE – Public State Employment Service[25]	It pursues the objective of improving the employability of those under 30; favouring the employability of groups affected by unemployment, improving the quality of training, promoting entrepreneurship. Annual employment plan[26]. Among others, it implements a Programme to promote agricultural employment (Aragon Special Plan) in collaboration with local corporations.	with the region or local authorities)
	Passive employment policies: measures that seek to maintain the income of the unemployed for as long as they do not have a job. They are therefore the benefits paid to the unemployed, or the compensations to those who have taken early retirement.	National
Aragón ESF 2014-2020[27]	Priority 1: Promote sustainability and quality in employment and encourage labour mobility. Priority 2: Promoting social inclusion and combating poverty and all forms of discrimination. Thematic objective 8: Promote sustainability and quality in employment and encourage labour mobility. Thematic objective 9: Promote social inclusion, combat poverty and all forms of discrimination. It finances programs such as the "Program for the Integration of Migrants in the Rural Environment of Aragon"[28] funded by the ESF and the Government of Aragon and framed in the Comprehensive Plan for the Management of Diversity Culture of Aragon 2018-2021; Subsidies for the financing of actions in favour of the integration of people of foreign origin resident in Aragon 2019, ESF 2014-2020[29]. The objective of the subsidies is to finance projects that favour the active inclusion of immigrants residing in Aragon, within the framework of the Aragon ESF OP. The beneficiaries of the aid are local entities in Aragon such as town councils with a population of more than 15,000 inhabitants, counties and the Central Community of Zaragoza.	Regional (programme co-funded with EU and national funds)
Family Integration Aids[30]	Periodic or occasional financial aid in emergency situations.	Regional
Aid aimed at foreigners in Zaragoza[31]	Aid for accommodation, transport, healthcare, internet, language training and other resources.	Local
Aid for the refurbishment of accommodation for temporary workers in the agricultural sector in Aragón[32]	Public subsidies intended to encourage the fitting out of facilities for the accommodation under appropriate conditions of workers providing seasonal services on agricultural holdings in Aragon. The beneficiaries of the aid are businessmen who carry out measures to provide accommodation for temporary workers.	Regional

25 www.sepe.es/
26 www.boe.es/boe/dias/2019/03/15/pdfs/BOE-A-2019-3699.pdf
27 www.aragon.es/en/-/presentacion-p.o.-fondo-social-europeo-de-aragon-2014-2020-fse-fondos-fondos-europeos-gobierno-de-aragon
28 http://cepaim.org/que-hacemos-convivencia-social/desarrollo-rural/programa-integracion-de-personas-migrantes-en-el-medio-rural-de-aragon/
29 www.boa.aragon.es/cgi-bin/CONV/BRSCGI?CMD=VEROBJ&MLKOB=1079381922727
30 www.aragon.es/-/inclusion-social.-prestaciones-economicas.-ayudas-de-integracion-familiar
31 www.zaragoza.es/ciudad/sectores/jovenes/cipaj/publicaciones/sector01.htm
32 www.aragon.es/en/-/ayudas-para-el-acondicionamiento-de-alojamientos-destinados-a-trabajadores-temporales-del-sector-agropecuario-en-aragon

(c) Recent trends and patterns in the region, and determinants of future employment evolution

In the 2001-2012 period the population of Aragon registered an important growth, but a **demographic regression** then started and still continues today, with a 3% decrease of the population in the period from 2012 to 2018.

Aragon's **agricultural gross value added** was on a downward trend between 2000 and 2008, when it began to progressively increase. The importance of the sector in the economy as a whole remains higher than the national and European averages.

The **costs of agricultural production** have multiplied in the last 20 years, growing at a different rate than the final agricultural production, and now accounting for 57% of the value production (in 1997, it accounted for 44% of the value of production).

Between 2003 and 2016, the number of full-time agricultural workers decreased by 33% down to 81,243 people, and the number of farm managers' family members working in the holding was cut by half. On the other hand, the number of permanent workers increased by 51% in the period.

Between 2003 and 2015, the number of farm managers younger than 40 years old decreased by an impressive 53.7% down to 3,153 people, a trend which illustrates the **progressive ageing of the agricultural sector.**

(d) Prevalent challenges in the region

The process of **depopulation** (population density of 11.62 inhabitants/km^2 in rural areas) and **ageing** which affects a significant part of the region as well as the **strong territorial imbalance** (47% of the population resides in only three of the 728 municipalities) are two of the most important challenges for the region.

The maintenance of agricultural employment is closely related to:

- The survival of a **family farming model,** linked to the territory, facing difficulties such as the progressive ageing of its workforce and the limited productivity of small-sized farms (56% of farms in Aragon have an economic size of less than 19.2 ESU).
- The **crisis situation** in some key sectors of the region's economy, such as the sweet fruits sector, to a large extent fuelled by increasing competition from third countries and the weakness of the agricultural sector in the whole agri-food complex (limited impact on price determination).
- The **viability and adaptation to adverse climatic conditions** of a large share of agricultural holdings: extensive, located in less-favoured areas and subject to significant risks of erosion, desertification and natural disasters.
- The current **technological revolution** and the capacity to take up and implement new technologies: a challenge that is particularly relevant for family farms and for rural areas located in territories presenting a situation of disadvantage (digital divide).

(e) Focus theme: migrant/seasonal workers in the fruits sector, their integration into rural communities and the role of the CAP to facilitate their integration

This section analyses the particular situation of agrarian migrants/seasonal workers in Aragon, their integration into rural communities and the role of the CAP to facilitate it. Aragon is an interesting region in that regard: it is one of the six Spanish regions featuring a **high concentration of temporary workers** (3.5% of the total number of days is worked by temporary workers). Also, statistics show that the integration of the migrant population in the regions' rural areas has acquired a very relevant

dimension, especially in some fruit-growing regions where the foreign population represents more than 20% of the total population.

In fact, analysing the situation of temporary agricultural workers in Aragon necessarily implies focusing one's attention on the fruit sector, which concentrates 65% of temporary salaried labour[33]. The difficulty in resorting to mechanised labour for certain tasks associated with fruit growing and harvesting determines the significant need for temporary labour at certain times of the year.

The profile of seasonal workers in Aragon has significantly evolved in recent years and is now mainly covered by **foreign population.** In many cases, temporary workers constitute a *"floating population"* without a fixed residence and a vulnerable group at risk of exclusion.

The close relationship that exists in Aragon between temporary agricultural work and the fruit sector means that the impact of the CAP on this group of workers could be indirectly produced through an improvement in the fruit sector, by specifically supporting a greater **cooperation and better organisation of producers** and promoting a stronger position of the producing sector in price formation (i.e. overcoming the disadvantage faced by a highly fragmented sector in front of a highly concentrated distribution with regard to the commercialisation of its products by passing on rising costs to sales prices)[34].

Better integration of migrant/seasonal workers in rural areas could be reinforced through the **Rural Development Programme** financed by the second pillar of the CAP, always in synergy and coordinated with other funds, especially the European Social Fund. In particular, **Local Action Groups** can play a very relevant role as agents with good knowledge of the territory within the framework of possible multi-fund local development strategies.

Overall, this subject matter lies at a **crossroads of various policies beyond agricultural policy,** in particular **employment and migration policy,** but also **international trade.** Common understanding of the impacts of these policies and the need to find elements of cooperation and coordination in their implementation serves as one of the main **policy recommendations.**

More generally, strengthening the "social" aspect of the CAP, covering both the **well-being** of agricultural workers and the maintenance of a **socio-economic fabric** in the rural milieu closely linked to a type of family agriculture rooted in the territory, continues to be a key challenge for the future CAP.

4.3.5. Southern and Eastern region (Ireland)

(a) Territorial characterisation of the region

The region covers the Southern and Eastern parts of Ireland, with a total population of 3.5 million inhabitants and a population density of 96 inhabitants/km^2. The climate is mild and can be described as temperate oceanic with cool summers and mild winters. Prevailing winds are from the southwest, and the north Atlantic current keeps the country warm in winter and cool in summer, with relatively high levels of rainfall year round.

[33] More specifically, of the 10,230.8 thousand hours of temporary wage labour in 2016, a total of 6,666.9 thousand hours were focused on this sector.

[34] Besides working on a better organisation and planning of supply, it is still necessary to work on the effective application of the actions set out in the Control Plan of the Food Information and Control Agency (AICA), especially in relation to the compulsory contracting established by Law 12/2013 on measures to improve the food chain.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description	Governance level (EU, national, regional, local)
Tax relief schemes – land lease	Exemption of Certain Income from Leasing of Farm Land €18,000 per annum where leases are 5 or 6 years, €22,500 per annum where leases are 7 but less than 10 years, €30,000 per annum where leases are for 10 but less than 15 years, €40,000 per annum where leases are for 15 years or more.	National
Stock Relief	25% General Stock Relief on Income Tax, 100% Stock Relief on Income Tax for Certain Young Trained Farmers, 50% Stock Relief on Income Tax for Registered Farm Partnerships, Relief for Stock Transfer due to discontinued Farming Trade.	National
Farm Assist Scheme	Farm Assist is a weekly means-tested payment for low-income farmers aged between 18 and 66 years who satisfy a means-test.	National
Pay Related Social Insurance (PRSI) for Farming Spouses or Civil Partners	From 2014, certain spouses and civil partners of people who are self-employed can access social insurance by paying PRSI to build up entitlement to social insurance benefits as a self-employed worker.	National
Rural Social Scheme (RSS)	The RSS is aimed at low-income farmers and fishermen/women. To qualify for the RSS farmers must be getting a social welfare payment. In return, people participating in the RSS provide services that benefit rural communities.	National
Young Trained Farmer Relief	This scheme provides for relief from stamp duty on the transfer by way of gift or sale of agricultural land (including buildings) to young trained farmers who meet certain conditions.	National until 2018
Employment Incentive and Investment Scheme (EII)	Individual investors obtaining tax relief on investments made into EII certified qualifying companies.	National

(c) Recent trends and patterns in the region, and determinants of future employment evolution

The **main trends** in the region regarding farm employment across the 2003-2016 period are:

- An ageing farm population.
- A decrease in full-time farmers and an increase in part-time farm work.
- No change in the gender balance.
- Continued evidence of impact from the 2008 financial crisis and economic recession.
- Increase in livestock production (in particular the dairy sector – assisted by removal of milk quota) and cereals production.
- Reduction in requirement for additional unskilled farm labour as farms increase in size and invest in new technology.
- Difficulty in attracting and keeping farm workers – especially in the dairy sector due to low wages and the part-time nature of work. Performance of the national economy impacts on the agricultural workforce supply.
- Young farmers are more highly educated than older farmers.
- Increase in farm partnerships – highest proportion of partnerships in Ireland.

The farm population shows an **ageing structure** in common with many other parts of Europe, with more than half of farm holders aged 55 or over, while just 5% of farm holders are aged under 35 years old. In terms of gender, the vast majority (72%) of employed farm labour is male and only 28% is female, with virtually no change in the numbers over the 2013-2016 period. Across Ireland a significant number (approximately 60%) of farm holders are part-time.

In the region the **proportion of full-time farmers** is likely to be high given the prevalence of the dairy sector which has the highest proportion of farmers with farming as their sole occupation. The farm population (outside dairy) is characterised by part-time work for both farm holders (supplementing income with off-farm employment), family members, and hired farm workers.

Investment in new technology (e.g. robotics for milking) and a steady increase in herd/farm size are both decreasing labour requirements in the region. According to the National Farm Survey (2018) the amount of unpaid labour supplied nationally was highest on dairy farms at 1.4 labour units and lowest on "cattle other farms" at 0.9 labour units.

Since 1990 there has been a dramatic increase in the percentage of Irish farm managers with basic or full **agricultural training.** The share of farmers relying on "practical experience only" declined from about 90% in 1990 to approximately 50% in 2013. The overall rebound in agricultural education enrolments over the last decade, combined with the exceptional level of adult farmer enrolments which has occurred in very recent years, should lead to a significant improvement in educational qualifications among young farmers in the medium term. Over recent decades, national policy has prioritised *"young trained farmers"* for various farm schemes and incentives. The minimum qualification for a "young trained farmer" is a recognised QQI Level 6 agricultural qualification or equivalent. The main changes have occurred in the specialist dairy and beef sectors, which are the most profitable parts of the agricultural economy. Dairy farming is concentrated in the case study region.

(d) Prevalent challenges in the region

Key challenges for the region include:

- Historical lack of investment.
- Access to land and financial resources.
- The lack of on-farm diversification activity.
- Various levels of farm viability across agricultural sub-sectors, with some sectors (e.g. dairy) being more "viable" and "sustainable" than others.

The impact of the **financial crisis of 2008** is apparent in the sharp decline in income experienced in 2009-2010, although the sector appears to have recovered relatively quickly, with income stabilising and growing once more from 2014 onwards. Fixed capital formation, however, declined by 37% across the ten-year period. In 2009, fixed capital formation dropped by around 75% and in 2017 it was still significantly below the value achieved in 2008. Statistics suggest that business survival has been at the expense of investment over the period 2008-2017. Despite difficult conditions, gross new **investment on Irish farms has recently increased** by 8% between 2017 and 2018 with dairy farms accounting for more than half of the total investment in 2018.

At the same time there is only a **limited level of diversification** occurring in the farm sector across the region. Farm holders tend to supplement farm income with off-farm employment (e.g. in the construction industry) rather than diversify and add value to agricultural production. Over the 2007-2016 period the number of farms involved in some form of diversification or pluriactivity increased slightly. The most common forms of diversification are agricultural contracting and forestry work, and only very small numbers of farms have diversified into agritourism or on-farm processing. Diversification opportunities are limited by the low density of population and limited visitor numbers.

Difficult access to land continues to create problems for new entrants and farmers wanting to expand. Only limited amounts of land come onto the market and prices are high due to competition. The land rental market is dominated by the *"conacre",* a 11-month rental system, which mitigates against

investment and land improvement. Although recent tax incentives have made longer term rental more favourable, conacre is likely to remain the dominant form of land rental in the region.

New entrants to farming also face barriers to accessing finance. Without assets they cannot borrow money to get started, and lenders do not take into account the amount of time required to establish a stable and effective livestock management system. Dairy is currently the only profitable activity across the agricultural sector, but even here young farmers and new entrants face difficulties in accessing both credit and land.

(e) Focus theme: generational renewal and new entrants in agriculture (especially younger people)

Generational renewal in the Irish agricultural sector has been of concern for several decades and many of the issues associated with an ageing farm population have been acknowledged since the early 1970s. In recent years there has been a rapid increase in the number of older farmers (31% increase for those over 65 years of age over the 2000-2010 period), and a reduction in the number of farmers aged under 35 years.

Cultural factors linked to land ownership severely restrict access to land, and socio-economic factors such as lack of rural housing, declining rural services, and access to higher paid jobs in other economic sectors have encouraged out-migration of young people out of rural areas. Specific problems include:

- Older farmers not retiring (due to loss of status, social exclusion, loss of income, poor pension provision).
- Older farmers are able to reduce agricultural activity and still draw down EU support payments.
- Limited availability of land for sale (less than 1% agricultural land available each year) and high prices.
- Limited availability of land for long-term lease.

Other factors creating barriers to young farmers include: lack of succession planning, absence of tax incentives for older farmers to encourage early transfer, cultural perceptions on the importance of keeping land in the family and young people's perceptions of agricultural work as low-paid and hard work.

Lack of succession planning: Traditionally farms are passed on to the younger generation only on death or incapacity of the farm holder. There is thus a tendency for farmers not to inherit the farm until they are in their 50s or 60s. Teagasc, the Irish agriculture and food development authority, currently runs succession planning clinics which are well attended, but a significant proportion of older farmers have no succession plans, and changing cultural perceptions is slow and difficult.

Access to land and land mobility: The majority of land is transferred within families with very limited amounts made available for sale in any one year; prices are high and YFs have limited access to credit. The alternative option is land rental but the majority of land is only available on short-term 11-month leases (known as "conacre"). Longer-term leases are becoming more available as a result of tax incentives, but in the most profitable sectors competition for land pushes up prices, making it harder for young farmers/new entrants to compete with established farmers.

Afforestation: A more recent concern has been pressure for afforestation. Afforestation is largely driven by two factors: government planting targets of 7,000ha/year to help Ireland meet its climate change goals, and older farmers seeing woodland as a means of generating a form of "retirement income" with less associated risk than leasing.

In the case study region, dairy farming is seen as the main driving force of the agricultural sector and will continue to expand, largely through conversion (from mixed farms) and rental of land. Tillage (cereals, potatoes and other vegetable crops) is a highly efficient area of activity and will continue to be a significant part of the agricultural activity in the region. A significant challenge for the tillage sector is to deal with changes to controls on agri-chemicals, which may result in yield reduction, pushing farms towards dairy conversion.

Policy recommendations to overcome the above-mentioned challenges, in particular generational renewal and new entrants in agriculture, include:

- Redefine the term *"active farmer"* to encourage older farmers to leave and support new entrants, and to encourage farm transfers to younger farmers.
- Provide support to help active farmers manage risks (e.g. from climate change or the introduction of new techniques), and to support more innovative behaviour.
- Provide greater support for collaboration and partnerships between farmers.
- Allow for more flexible work permits in the agri-food industry.

4.3.6. Corsica (France)

(a) Territorial characterisation of the region

Corsica is an island located in the Mediterranean Sea, south of France. The region has a population of around 336,000 inhabitants and a population density of only 39 inhabitants/km^2. The population is actually mostly concentrated on the coastline, away from the many mountains. In addition, more than half of the island is covered by forests. Corsica has a Mediterranean climate, however with a high level of rainfall in some parts of the island (above 1000mm per year). Agricultural activities are mainly concentrated on the arboriculture-oriented eastern lowlands.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description (aim and target beneficiaries)	Governance level (EU, national, regional, local)
Plan d'Avenir ***("Plan for the Future")***	This Plan is addressed to agricultural development bodies which provide technical assistance on cross-cutting issues such as employment.	National/Regional
Fonds CasDAR ***(Compte d'Affectation Spécial "Développement Agricole et Rural")***	Financed through a tax on agricultural holdings' turnover, this fund aims at supporting the activities (e.g. collective projects, technical development) aiming at the agro-ecological transition of agriculture and undertaken as part of the National Programme for Agricultural and Rural Development. In 2017, it amounted to €133.4 million[35].	National
EAFRD (Rural Development Programme Corsica 2014-2020)	Based on an ex ante needs assessment of the region, the 2014-2020 Rural Development Programme of Corsica supports four broad strategic objectives (land, knowledge & innovation and business set-up, production and environmental efficiency, and territorial action) and is implemented through the EAFRD (ca. €149 million over 2014-2020).	EU

[35] Source: French Ministry for Agriculture and Food (2018), *Développement agricole et rural : des innovations au service des agriculteurs, des filières et des territoires* (https://agriculture.gouv.fr/developpement-agricole-et-rural-casdar), July 2018.

(c) Recent trends and patterns in the region, and determinants of future employment evolution

Total **agricultural employment** (as measured in AWUs) has decreased by 30% between 1988 and 2000 and by a further 22% between 2000 and 2010. However, total agricultural employment has increased by 1.1% between 2010 and 2016. More specifically, employment has increased across all agricultural sectors over this period, apart from the cattle meat and poultry sectors[36]. The stagnation or even decrease of employment in animal husbandry – especially cattle and pig husbandry – is mostly due to the issue of access to land in Corsica. In addition, the sale price for cattle, sheep and goat meat has been reported as dramatically low. It should also be noted that for some regional meat-based agricultural products, sales are considerable varying throughout the year, with peaks in Christmas and Easter and difficult marketing during the rest of the year.

On the other hand, a **few agricultural sectors** are performing particularly well in Corsica, namely viticulture, citrus fruits growing and organic farming. In the region more generally, revenues from crop production are higher than revenues from livestock production and the crop sector is also better organised and structured than the animal husbandry sector, both factors inducing some young farmers to a shift from livestock to crop farming.

In terms of future employment prospects, **no radical change** is to be expected in the coming years, as employment figures have been pretty stable in the last few years. The majority of agricultural holdings in Corsica are human-sized, and no further consolidation of the sector is to be foreseen, due to the specificities of the territory, the difficulty for accessing land and the rearing methods used by Corsican farmers.

Nonetheless, two crucial points should be raised, in that regard: first, the agricultural under-production which characterises the region both with regard to local and external demand as well its agricultural potential is not sufficiently taken into account in the current CAP, and especially Pillar 1 decoupled aids which are not (sufficiently) encouraging production. A CAP support tailored to the needs of the region could further stimulate agricultural production and employment locally without hampering the region's transition to a more sustainable and ecological economy, as demonstrated by the region's inclination to protect its many natural areas; second, a properly established land cadastre (and consequent restructuration of agricultural lands) would allow for more farming land transfers to younger, more productive generations and significantly fewer problematic area-related direct payments controls. Without these two required improvements, the Corsican farming sector is at **risk of recession** over the short-to-longer term.

(d) Prevalent challenges in the region

Despite a large agricultural potential (arising from, inter alia, the vast amount of unfarmed land, the agricultural know-how of local farmers and the region's favourable territorial conditions for producing quality products), the region's **agricultural supply falls behind the demand**[37] – which can only be met through importations from the continent (not only of agricultural products, but also of agricultural inputs such as fodder). Most strikingly, this **under-production** issue is further exacerbated by a range of aspects. Insularity is obviously one of them, as distance to the continent adds transport costs to the burden incurred by Corsican farmers when importing their primary agricultural inputs from outside the island – an obstacle to investing in additional production capacity. This issue is not currently addressed

[36] Sources: Agreste, *Recensements 1988, 2000 and 2010*, and Agreste (2018), *Bilan annuel de l'emploi agricole – Résultats 2016 et estimations 2017*, Extrait de «Agreste Chiffres et Données – Série Agriculture n° 253».

[37] Local agricultural production meets only one third of local demand (Source: Collectivité Territoriale de Corse, Programme de développement rural (Rural Development Programme), 2018, p.67).

by the CAP – and in particular the regional RDP -, as the relative closeness of the region to the rest of Europe prevents the region from any specific status vis-a-vis other European regions. Besides, the large proportion of hardly accessible, unfarmed land as well as the low investment capability on already farmed land (a direct consequence of low agricultural income) are further curbing agricultural production in the region. The CAP, because of its uncoupled financial support to farmers, is not aiding agricultural production. Finally, agricultural under-production combined with a high demand for Corsican products gives rise to the commercialisation of fraudulent products, wrongly branded as quality products from Corsica.

Access to land in Corsica has been highlighted by interviewed stakeholders as well as in the 2014-2020 Rural Development Programme as the main issue for farmers, and more broadly for the agricultural development of the region. The **land cadastre** of the region is largely incomplete and outdated, preventing property titles to be issued for the transfer of agricultural holdings outside the family circle. This results in a high proportion of fertile though unfarmed lands that owners do not make available for other farmers, as 1) property transfer is hardly feasible without a proper land register and 2) agricultural pensions are deemed to be very low – lower than CAP direct payments -, therefore inducing older farmers to stay in business, even for no or little production. In a region characterised by agricultural under-production, access to uncultivated lands (for instance by dissociating ownership and farming rights) is of pivotal importance. It is estimated that out of the 450,000 hectares of agricultural land in Corsica, only 250,000 hectares are declared by farmers – meaning that around 44% of agricultural land is unfarmed. Additionally, agricultural production is in competition with the tourism and construction sectors for accessing land (Rural Development Programme, 2018).

According to the 2010 survey from Agreste, **farm managers older than 60 years** represented nearly one fifth of all farm managers of the region. Furthermore, more than half of the Corsica-based farm managers are aged 50 years old and above, and more than two thirds of them do not know who will take over their holding. This percentage is higher in sectors such as cattle and multispecies breeding, and lower in viticulture, where 55% of winegrowers above 50 years old know their successor on the holding (Agreste, 2015). While this could raise concerns regarding generational renewal in the agricultural sector of the region, the clear lack of farm transfer/succession to younger farmers is compensated for by a **high rate of farm business set-up from young farmers.** Indeed, the number of farms managed by farmers under 35 years old has increased by 25% between 2010 and 2016. Nonetheless, it is believed that more young people (including those without "agricultural roots") could be prompted to 1) take over agricultural holdings, should a proper land register be in place and 2) take up agricultural jobs, should the sector be more attractive in terms of income and working time.

(e) Focus theme: On-farm diversification and microeconomic strategies

Diversification of on- and off-farm activities plays a crucial role in reducing farmers' dependence on single-source income (farming) and increasing their revenues. In particular, the **processing** (e.g. from milk to cheese, from pork to cold cuts) and **commercialisation** of agricultural products in **short food supply chains** (e.g. on the farmers' premises or nearby local markets) as well as **agritourism** are increasingly prevalent among Corsican farmers, especially during the tourist season. In Corsica, almost two-thirds of farms holders market part of their production (except wine) in short food supply chains and therefore considerably increase their revenues: for 70% of them, this short supply marketing represents more than 75% of their holding's turnover (Agreste, 2015). On the other hand, agritourism is still under-developed relative to its potential. For those agricultural holdings engaged in agritourism, agritourism activities represent on average nearly 40% of the holdings' turnover (LISA, 2015), but these activities are still mainly offered and organised through word of mouth and private networks (Ibid.).

The limited availability of space (also due to the complexity of land transfer between farmers) constrains the possibility of hosting tourists on site. Some farmers are therefore offering more informal accommodation to hikers in so-called "paillottes" (straw huts) during the high season only. Likewise, the installation of solar panels on sheds is gaining in importance, although the limited availability of land is a significant constraint to the further development of renewable energy production. Firewood and fuelwood production is also to be found as a fairly common secondary activity among farmers. Finally, earthwork and scrubland transformation are performed as value added activities by a minority of farmers.

The **popularity of local products** (in particular for their quality) as well as the favourable conditions and existing infrastructure for (mass) tourism in the region are expected to further boost the importance of short food supply chains off the beaten track and the professionalisation of agritourism activities by farmers in less tourism-oriented areas. However, on-farm diversification is still predominantly seasonal and thus does not guarantee an additional source of income throughout the year. Regulation on mass catering from local products – in particular through a national law to be complied with by 2022 – should support agricultural product processing activities by farmers on a more permanent basis. These two aspects form an integral part of the **product differentiation-**based microeconomic strategies adopted by local farmers, relying in particular on the widely recognised value of regional products (i.e. Corsican products are deemed to be of high quality). This strategy also applies to agritourism, where "rurality" and "home produce" become compelling selling points and a **competitive advantage** in a professionalising agritourism environment (LISA, 2015). While supporting the revitalisation of rural areas, the risk is then for agritourism to "eat up" resources (primarily agricultural land and labour time) at the expense of an already lagging agricultural production. This calls for an integrated, coherent and **synergistic agritourism-rural development policy** based on a thorough understanding of the specific strengths and weaknesses of the territory, where agritourism not only helps maintaining farming employment but also agricultural production.

Based on the region's territorial specificities and with due consideration of the region's agricultural situation characterised by under-production, **recommendations for the CAP 2021-2027** include:

With regard to Pillar 1:

- the reintroduction of coupled support, to more efficiently incentivise agricultural production and the transfer of agricultural holdings owned by older farmers,
- the rebalancing of direct payments from aids targeted at individual farmers to aids targeted at farmers' cooperatives, so as to bolster agricultural employment, increase the availability of support to holdings in difficulty, and more generally foster economies of scale in agricultural production and marketing,
- the reduction of administrative burden and delays related to (the application for and receipt of) direct payments to farmers,
- the introduction of direct aids aimed at the preservation of the natural environment and biodiversity; for instance, support payments for the creation of natural firewall against wood fires in areas with natural constraints – this scheme would be decoupled from production, and would contribute to the maintenance of social fabric in more remote rural areas while increasing the income of the populations living there.

With regard to Pillar 2:

- a stronger focus on and more budget allocated to farm diversification and pluriactivity, which is key is raising farmers' income and more generally increasing the attractiveness of jobs in rural areas,
- more attention paid to and support provided for the restructuring of some agricultural sectors,

- more support for technological development, in particular for farming technologies adapted to the territory's uneven relief,
- more generally, the elaboration of a more global and coherent rural and farming development programme.

4.3.7. Upper Austria (Austria)

(a) Territorial characterisation of the region

The federal state of Upper Austria is located in North-Western Austria, with a population of 1.5 million inhabitants and a population density of 122 inhabitants/km^2. It is characterised by three main geographic features: 1) the lowlands, shaped by the Danube river, mainly consisting of the *"Alpenvorland"* – flat to medium-hilly terrain mainly used for agriculture and partly for forestry, 2) the medium-height mountain range of the *"Böhmische Masse"*, North of the Danube – hilly to mountainous terrain and 3) the alpine regions in the South. The region is characterised by a continental and oceanic climate, with Atlantic influence in the South. Average yearly temperature is 7.6°C, with denser populated lowlands closer to 9°C and less populated alpine regions averaging below 5°C. The yearly precipitation of 1150l/m^2 is above the Austrian average, with high fluctuations between 735l in Northern mountainous regions and up to 1800l in Alpine regions.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Short description	Governance level (EU, national, regional, local)
ERDF OP Austria	Aligned with the smart specialisation framework, the food production sector is one of the focus areas of R&D. Furthermore, complementing the approach of EAFRD in Austria, tourism support is limited to small and medium sized enterprises, among others targeting the agritourism sector.	National
RIS3 Upper Austria	Food production and processing is one of the core action fields of the strategy. An emphasis is placed on the production part of the value chain, indirectly supporting farming employment through support for innovative development and increase of value added.	Regional
Masterplan for rural areas	Overarching national strategy to strengthen rural areas. Direct and indirect support to farming employment is outlined, e.g. support for young farmers, measures for supporting part time farmers, measures to support ageing farmers and active ageing in general.	National
Tourism Strategy Upper Austria	Both agricultural products as well as farms as integral part of tourism accommodations are identified as key elements for sustainable growth in Upper Austria. Support schemes for small farms to stay in business and support the "destination Upper Austria" from a tourism perspective are encouraged. Targeted marketing of regional products as part of the "destination" is identified as potential for synergy with agricultural labour markets.	Regional
Work programme of the National Austrian Research Funding Association	Within the work programme, key funding priorities are defined which guide national and international funding schemes in Austria. Agriculture and especially food production are two of the priorities targeting innovation in the agricultural sector.	National
Regional development strategies	In the case study region, regional development strategies such as for LEADER-regions but also non-CAP related strategies are broadly established. Due to their strong regional/local differentiation, no "general policy" can be identified, however influence on the agricultural labour market is exerted through many of them e.g. via land use specifications and strategies, tourism strategies, etc.	Regional/Local

(c) Recent trends and patterns in the region, and determinants of future employment evolution

The **farm structure** in Upper Austria is dominated by small (less than 20ha in size) family farms, with large farms (above 100ha) having a share far below the EU-average. Farm consolidation is taking place at a slow rate, with handover from one generation of farm owners to the next being its main driver. The average size of farms will thus increase slightly, with a shift from "very small" to "small" farms.

Farm numbers in the region have been decreasing and will continue to do so. One aspect of that decrease is related to the **demographic change** and **out-migration** in rural areas, with younger generations not willing to take over the farm of their parents. This is particular relevant for part-time farmers, whose numbers in Upper Austria have been decreasing at a much faster rate than full-time farmers.

The general trend in **farm labour force** is likely to continue as a reduction in the overall number of farm workers, however the shares of family and non-family workers are not likely to change. Seasonal workers in the case study region are not relevant for the predominant types of agriculture practiced and are not likely to gain in importance in the future.

With regards to **policies,** the responsibility for implementing EU funds as well as for implementing the most influencing strategies on agricultural employment will remain on the national level. For the next programming period, The European Commission has emphasized the relevance of subsidiarity and **regional/territorial approaches** as a guiding principle, however the practical application cannot be determined at this point.

(d) Prevalent challenges in the region

While Austria and the case study region in particular are supporting technological innovation and research with a high standard, there is both a **researcher-practitioner gap** as well as a general **information gap** hindering technological uptake in practice. Practitioners are slowly being included in research efforts, however they still lack consulting opportunities for recent technological development and on-farm application.

Particular challenging for the case study region is the prevalence of farms in **less-favoured areas** (especially mountain areas) with about 50% of the region's farms falling into that category. With an increase in free-trade agreements and a reduction in protective measures on the agricultural market, farms are increasingly exposed to market pressure. Production costs and other costs related to farm management are higher for small-scale, part-time farms and farms in less favoured areas, with them having fewer options to increase farm productivity than larger scale farms. Their **competitiveness** is therefore reduced.

Adding onto the challenges related to the small size of farms, for historic reasons (i.e. rooted in inheritance laws) the **field structure** is particularly unfavourable in the region. No large-scale consolidation has taken place in Upper Austria, thus typical farms own/lease several small fields scattered in the area. This further reduces the productivity of individual farms and pose a challenge for farms seeking to acquire farmland.

(e) Focus theme: technological development and innovation in farming practices

In Upper Austria, the **primary sector** in general is of relatively low importance, however, it is exerting considerable influence on other economic activities such as food processing and especially tourism. With the above-mentioned challenges impeding an increase in competitiveness of farms through an increase in farm areas, the region has to rely on **innovation** both in farming practices in the classical

sense as well as innovative approaches in farm organisation, operation and integration in regional value chains.

Without fostering innovation potentials and increasing farm income, the downward trend of farm and farm holder numbers will continue in the short, medium and long-term, not only reducing the overall number of farm workers but also reducing the UAA and volume of production. In the short term, direct impacts on employment are negligible, however in the long term employment in farming will be reduced considerably, especially impacting males who form the majority of the labour force as well as creating ripple effects on families and agriculture-related sectors.

Innovation potentials in the region are high on a technological level, however hindered in practice in relation to the above-mentioned information gap and researcher-practitioner gap, with the economic size of farms (less than 100.000€ for 80% of farms) posing additional challenges. Furthermore, the mind-set of farmers is not very innovation-oriented, with the handover from one generation to the next presenting the biggest opportunity for introducing technological innovation. Institutional frameworks aim to bridge those gaps, however the main driver of technological innovation on the farm level is still direct, technology-targeted investment support (e.g. investment in machinery) through various national schemes.

Far more advanced in the region however is **"soft innovation",** less related to technological change in production and more to exploiting ways of selling **by-products** and offering **side services** next to running the farm. In the region, examples of such innovative initiatives include:

- *Greencare,* making use of farming (especially animal-related) activities within therapeutic care and elderly care.
- *"Destination"* initiatives embedded in an integrated tourism concept presenting specific aspects of the regional farming sector as key elements of a "destination" going beyond the traditional marketing of regional products.
- *Catering,* expanding the classic farm gate sales to professional business catering, particularly popular with organic farms.

These **integrated approaches,** not looking at isolated (production) sectors, are necessary as traditional production is unlikely to remain a main source of income for most farmers in the region. Technological innovation is one aspect in retaining farming employment, however it has to be entrenched in a wider farm development strategy, especially by fostering innovative farm diversification measures.

On the **policy level,** this creates the need for **regionally anchored action** rather than national initiatives, targeting the specific issues of the regional farming sector. Interlinking sectors, research with practitioners on the one hand, but also e.g. tourism, healthcare, etc. on the other hand will create opportunities at the farm level, while institutional frameworks are necessary to support individual farmers. A final key aspect is to decrease dependency on (CAP and national) direct support measures, by e.g. making use of the current debate about **carbon emission reduction** to promote **high quality, high price local and regional products –** thereby allowing small farms in the region to circumvent market pressure.

4.3.8. Brandenburg (Germany)

(a) Territorial characterisation of the region

The federal state of Brandenburg is located within North-Eastern Germany, being one of the *"new"* federal states of Germany having accessed into the Federation in 1990 together with the other territories of the former German Democratic Republic. It has a population of 2.5 million inhabitants but

a population density of only 84 inhabitants/km^2. Brandenburg is completely landlocked by other federal states to the West and Poland to the East. The climate of the state is continental, with pronounced peaks in summer and rapid temperature changes over spring and autumn months. The region has no mountain but has over 3000 lakes and over 33 thousand kilometres of waterways. The Baltic Uplands stretch into Brandenburg, with a landscape characterised by rolling hills and fertile soil.

(b) Institutional frameworks governing the regional agricultural labour market

Name of the institutional framework	Aim and target beneficiaries	Governance level (EU, national, regional, local)
Federal labour code, via Bürgerliches Gesetzbuch (Civil Code)	Aimed at agricultural workers and employees.	National
Collective Bargaining Agreements	Aimed at agricultural workers and employees.	National
GAK 2019-2022 (*Gemeinschaftsaufgabe „Verbesserung der Agrarstruktur und des Küstenschutzes")*	A comprehensive set of measures is supported under the GAK 2019-2022, so as to improve farm productivity.	National/Regional (implemented on state *(Bundesland)* level)
Rural Development Programme (RDP) Brandenburg/Berlin 2014-2020	Rural development primarily via Measures 01, 04 and 06.	Regional (implemented on state *(Bundesland)* level)

(c) Recent trends and patterns in the region, and determinants of future employment evolution

The **agricultural sector remains a small, but productive segment** of the economy. Since the early 2000s the agricultural labour force has fallen by approximately 19%, a significant decline in persons employed in the sector. GVA has fluctuated significantly over the observed timeframe. Cereals remain the most important crop in the agricultural sector. All crops bar vegetables and horticultural products are marked by strong fluctuations. A minor sectoral reorientation is observable: the importance of vegetables and horticultural products is increasing, as is the importance of industrial crops. Since the mid-2000s, these crops have grown steadily in economic importance.

A recent study into the agricultural labour needs in Brandenburg commissioned by the agricultural ministry (Welker et al., 2018) identified several key trends in the agricultural sector:

- A massive generational replacement is necessary until 2030, with approximately 76% of jobs needing to be replaced. This trend can be observed among the general agricultural labour force, but also among leadership positions.
- A further concentration of economic activity is expected. The number of larger farms (with more than 1000ha of land usage) is increasing, inversely to the number of smaller farms.
- Continuation of the shift to organic production and production for local markets, among famers, is foreseen.
- As such, the agricultural sector is currently undergoing some degree of sectoral reorientation in terms of main products and consumers, coupled with significant forecasted labour shortages. These labour shortages have potentially already impacted the increasing incidence of seasonal work in Brandenburg.

(d) Prevalent challenges in the region

Migration to older federal states *("Länder")* subjects the labour force to persisting pressure. **Interregional migration of young people** to the older federal states reduces the available labour pool in rural regions. The consequences of the German reunification are still felt in that regard: immediately

after the fall of the Wall, significant parts of the population migrated to the older federal states, leaving a pronounced gap in the age structure. This is reflected in the findings of the study from Welker et al. (2018) on the regional labour force: as significant numbers of incumbent farmers and farm workers (around 20,000 out of 26,000) move into retirement by 2030, these gaps are felt in the production capacity of the sector.

Agricultural holdings in the newer federal states are in general characterised by a **lower degree of family-based ownership and production** than their counterparts in the older federal states. The post-war collectivisation policies of the German Democratic Republic played a significant role in reducing the role of family farms within the East German agricultural sector. Further, reunification saw a collapse and restructuring of the agricultural sector with related uncertainties. Throughout the *"Wende"* migratory patterns to West Germany contributed to a lop-sided age structure, with many young people exiting the sector. The sector has since stabilised. However, problems related to gaps in the age structure persist.

(e) Focus theme: territorial development and generational renewal in rural and sub-urban areas

In addition to emigration pressures and structural change post *"Wende"*, the agricultural sector in Brandenburg faces a variety of **drivers** in the context of generational renewal:

- The sector is characterised by relatively low incomes and long working hours (Welker et al., 2018).
- Stigmatisation in media due to conflicts around production methods and land use.
- Differences in living standards between rural and (sub-)urban areas.
- Labour force competition around the metropolitan centre of Berlin.

The attractiveness of the agricultural sector is low in comparison to other sectors: the sector is often perceived as a black sheep by the media. Consumers pose stark demands but are generally unwilling and unaware of the economic cost tied to higher production standards. To some extent, efforts by pressure groups around production methods contribute to the negative societal perception of the sector. However, this pressure is not necessary unwarranted and counteracted by actors within the agricultural sector. This negative perception is also influenced by reality TV shows, such as *"Bauer sucht Frau"* which contributes to the stigmatisation of farmers by the urban population.

Berlin exerts significant labour pressures on its surroundings: employment prospects (especially for relatively lower skilled individuals) remain high in the capital city of Germany. The intensive labour force competition around Berlin is fuelled by labour intensive sectors (such as logistics centres) which absorb significant parts of local surplus labour and import labour from other German regions/cross-border regions (e.g. from Poland). A sector which is characterised by low incomes and long and physically demanding working hours, such as the agricultural sector (Welker et al., 2018), faces problems in regards to new entrants. Generational renewal is impeded due to reduced earning potential within the agricultural sector as compared to other sectors within the economy. Primary factors in that regard are **financing difficulties** stemming from substantial increases in land leasing costs.

The developments observed in Brandenburg can be differentiated into two classes: applicable to Brandenburg and applicable to other newer federal states. Developments as a consequence of German reunification are found in other newer federal states as well. This concerns primarily continued emigration from rural areas: significant **gaps in the age structure** of rural areas are found across the newer federal states, as a result of sectoral restructuring post reunification and initial migration pushes in the 1990s. **Labour competition** due to varying levels of attractiveness of economic sectors and

suburbanisation around Berlin are more specific to Brandenburg. Developments as a consequence of labour market competition around Berlin (primarily labour scarcity) and suburbanisation can be found to varying intensities across other urban centres (primarily Munich and Hamburg) as well. The case of Brandenburg is more extreme, due to the relative size (in terms of population and economy) of Berlin vis-à-vis Brandenburg.

5. SYNTHESIS, CONCLUSIONS AND RECOMMENDATIONS

This section compiles the main findings from the analytical work described in the previous sections, namely the literature review, statistical and mapping analysis as well as all eight case studies. Based on a thorough synthesis of these findings, the main conclusions of this study are drawn up and targeted policy recommendations are proposed.

5.1. Synthesis

5.1.1. Key features of the EU agricultural labour force

The broad literature review undertaken in the initial phase of this study has shown that **family workers** still represent the vast majority of agricultural labour in Europe, offering a certain degree of flexibility (in terms of working patterns and pluriactivity) to the agricultural holdings. Apart from this, the greater part of the agricultural workforce (83%) is employed **part-time** and/or has farming as a secondary activity. The literature review also found that the share of **foreign workers** in the EU agricultural sector remains low, with 1.6% of workers from other EU Member States (intra-EU labour) and 2.7% of workers from third countries (extra-EU labour).

5.1.2. Main drivers of (structural) changes in EU agricultural labour markets

The literature review has also brought to light a range of key drivers of European agricultural labour markets:

- **Technological progress:** Technological innovation (e.g. satellite-based precision farming) contributes to the improvement of agricultural productivity by maximising food supply through higher yields and/or using less labour to achieve similar yields.
- **Member States transition** and higher attractiveness of the industrial and services sector: in Eastern Europe, the pre-accession times were marked by inefficient allocation of labour – in particular in the agricultural sector – which first resulted in higher farming employment levels (with additional workforce coming from the industrial and services sectors) during the transition period and subsequently led to strong decreases in agricultural employment, as higher-paid jobs in the secondary and tertiary sectors were thriving. Today, the persisting lack of attractiveness of the primary sector – and more generally of rural areas – in comparison to the latter two sectors – predominant in urban areas – sustains the downward trend of agricultural employment in many parts of Europe.
- **Age and education:** young people and people with higher education levels are more likely to be employed in non-agricultural sectors, in particular services.
- **Gender gap:** women are less likely to be employed in the agricultural sector than men.

5.1.3. Territorial patterns of farming employment and its determinants

The steady decline in the agricultural labour force observed at EU level has been slightly less pronounced since 2010, just as the number of farm sole holders. Yet this evolution hides wide disparities both in terms of the profile of agricultural workers and their spatial distribution. The number of family workers has been strongly decreasing in the EU as a whole (by more than a third over the 2005-2015 decade), while the employment of both regular and non-regular workers from outside the family circle has increased in recent years. However, the importance of **family farming models differs widely** from one Member State to another across the EU, and no clear North/South or West/East divide is apparent. In contrast, there is a tendency for regions in older and Mediterranean Member States to

favour the employment of temporary workers (in comparison to the other Member States), which can be explained through several reasons such as the type and seasonality of agriculture in these regions (e.g. viticulture) and labour conditions (e.g. higher wages). Similarly to the agricultural labour force, the number of farms has been declining in the vast majority of EU regions (with the noticeable exception of Czech Republic). Only farms larger than 100 hectares have been growing in numbers, in line with the consolidation of the farming sector reported in the literature.

5.1.4. Prevalent challenges for farming employment in the EU

(a) Structural changes within farms, in particular changes in working patterns

Intensification and Mechanisation

Increases in farm sizes, and intensification of production is a trend that has affected labour and generational renewal by both making new entry into farming costly and making it difficult for small scale farms, and family-based farms, to compete, an issue pointed out in the majority of the case study regions. Intensive farms require less on-farm labour, this keeps margins low, but reduces job opportunities in this sector. In regions which have a sector characteristically shared between large scale, and mid to small and family-based farms, the relatively faster intensification of commercial farms leads to out-competition, problematic for balanced territorial development and natural landscapes. In **Upper-Austria** traditional block-field and open-field land endowment systems limit farm size growth. In **South-west Oltenia,** land endowment and cadastre issues, keep farm sizes small, and low education levels and financial resources limit intensification and mechanisation. Even in this context, a major issue highlighted is the relative difficulty of small-sized farms to invest financially, and in terms of human capital, in technologies required to intensify and mechanise production.

Innovation

Innovation is critical to maintaining competitiveness in the farming sector, especially with respect to novel crop strategies, automatisation, marketing and distribution activities, as exemplified by numerous interviewees in **Upper Austria.** However, in almost all case study regions, on a farm level, a lack of information, extension services, knowledge and consultation opportunities creates a gap between innovations and their practical implication (Upper Austria, Podlaskie, Brandenburg, Southern and Eastern Ireland, South-West Oltenia, Corsica). A study commissioned by the Brandenburg Agricultural Ministry (Welker et al., 2018) found that smaller farms report more difficulties in applying new technologies and identifying the economic added value, than their larger peers. This problematic phenomenon affects both farms and innovation bodies, since both are stagnated in their development, coined the *researcher-practitioner gap* in Upper-Austria. On the other hand, measure 01 for knowledge transfer and information actions implemented as part of RDPs, as well as platforms such as the RIS3 bio-economies, are examples cited as initiatives supporting institutional efforts to promote innovation and its uptake in the agricultural sector. It is clear that such programmes, and extension services, continue to form a crucial component of promoting innovation and competition, particularly among small-sized farms.

Hours Worked

In the agricultural sector, hours worked is dependent on seasonality, crop, and degree of intensification and mechanisation. In **Campania** and **Aragon,** for example, with high labour-intensive seasonal harvesting requirements, each year farmers face uncertainty about whether they will be able to gather the required number of workers at harvest time. This circumstance is even more difficult for small

farmers, since temporary workers prefer employment in larger farm where they will be able to carry out more workdays. In addition, the complex employment system (e.g. in Italy) together with the inefficient private and public work recruitment agencies in the primary sector, are further hindering the ability of the market to adequately respond to seasonal and variable agricultural labour demand.

Gender

There is a gender imbalance among farm workers in all case study regions, apart from in **South-West Oltenia** where female participation is either at par with or higher than male. Furthermore, gender disbalances are greatest among seasonal and migrant workers.

Ageing Population

An ageing farming population, and lack of generational renewal, is a significant concern in all case study regions apart from **Corsica** where the absence of farm transfers – resulting in a large quantity of low-producing or even unfarmed lands – is counterbalanced by a high number of new business set-ups by younger people. A contributing factor is the outmigration of younger populations to areas with better social services and more economic opportunities, an issue cited in all case study regions. In **Brandenburg,** for example, the proximity to the urban centre Berlin makes the region especially susceptible to this trend. According to a study commissioned by the Management Authority of the RDP Brandenburg, in just under half of the farms a change of leadership will be necessary over the timespan of the following 10 years (Welker et al., 2018). Ageing populations impact innovation and uptake of new technologies, a confounding issue listed in several case study regions.

Education and Training

Education is a leading challenge highlighted in all case study regions. As a general trend, the education level is increasing among the farming population in the case study regions (apart from **South-West Oltenia).** Farm population education has greatly improved in **Southern and Eastern Ireland,** for example, and is considered quite good in **Brandenburg** and **Upper-Austria**. Low education is seen to be a barrier to the uptake of new technologies and to finding innovative solutions, and incurs a negative stigma on farmers reducing the willingness for new generations to join the sector, as highlighted in the **Brandenburg** case study and echoed in other case study regions. Institutional efforts in place among the case study regions include extension services, agricultural chambers, local and grass-roots programmes. In **Southern and Eastern Ireland**, education is an additional eligibility criteria for CAP 2014-2020 support (something applied overall in eight Member States and three regions[38]).

(b) Structural changes within agricultural markets, and farm-level responses/microeconomic strategies to adapt to these changes

Responding to the structural changes within agricultural markets, at a microeconomic level and within individual farms, is recognised as both a necessity and an issue in many of the case study regions (including Brandenburg, Campania, Aragon, Podlaskie, South-west Oltenia). In **Brandenburg** farmers recognise the need for structural changes, but a lack of information and consultation opportunities in an issue on the individual farm level. In **Aragon,** the fruit sector is going through a time of uncertainty, marked by the fall in sales prices and the continuous increase in costs. A determining factor has been the 2014 *Russian veto,* which eliminated an important market. Additional factors include the increased

[38] Belgium-Flanders, Belgium-Wallonia, Bulgaria, Ireland, Spain, France, Croatia, Austria, Portugal, Slovakia and UK-Northern Ireland.

availability of products from third countries at more competitive prices, the very atomized supply and distribution demands, the perishable nature of the products, and high seasonal labour needs. Given these difficulties fruit growers are adopting the strategy of the reconversion or progressive replacement of fruit trees with other less demanding crops such as almond or cereal. Similarly, **Campania's** primary sector heavily relies upon some specific agricultural sub-sectors, namely the production of fruits, vegetables and horticultural products, and animal products, with the former two macro-categories being labour-intensive sectors characterised by high demand of seasonal labour. In some countries (e.g. Italy, France, Spain), foreign workers are now forming part of the agricultural sector' structure. In **Podlaskie,** the importance of supporting farmers in making choices to expand activities and shift their focus is recognised. In an effort to tackle structural issues, **Podlaskie** is in the development of EU's Eastern Partnership with regional neighbours. Nevertheless, strategic regional documents point out several problems resulting from a national policy which is incompatible with regional interest and priorities that may result in a threat of marginalisation of the region, including an unfavourable transport policy.

(c) Entering the agricultural sector ("new entrants"), especially younger people

New entrants in the agricultural sector, especially young entrants, are a challenge iterated in every case study region. The reasons cited include lack of social services in rural regions, perceived lack of economic opportunity, lack of job availability, the negative stigma associated with farming, access to land from older generations (particularly highlighted in **Upper-Austria),** and the cost of land (especially in **Brandenburg** due to its proximity to Berlin). As highlighted in **Podlaskie,** young people seek opportunities for themselves in terms of financial gains, social security, and quality of life, in all of which the agricultural sector is perceived to have little to offer. In **Campania,** low agricultural wages and an increase in economic terms of other sectors of the Italian economy have made the agricultural sector unappealing for young and educated people, inducing to a shortage of domestic supply of agricultural labourers and the employment of migrant workers. Access to land is a major issue limiting new entrants in Brandenburg, Upper-Austria and Ireland. **Brandenburg** farmers close to Berlin are experiencing significant pressure on land for non-agricultural uses, making entry prices for new farmers very high. By contrast, in **Upper-Austria,** traditional block-field and open-field land endowment systems have made purchasing large areas of land difficult, limiting the ability for farms to grow above 20ha. Furthermore, handover to future generations is limited due to farmers facing financial strains preventing retirement and few incentives for handover in place. This is echoed in **Southern and Eastern Ireland** and **Corsica**. In **Corsica,** agricultural pensions are reportedly lower than uncoupled direct payments, artificially maintaining older farmers in activity. In order to mitigate this issue, the **Southern and Eastern Ireland** region has applied measures to promote succession planning, provide tax and financial incentives for early retirement, and promote long-term land leasing schemes.

(d) (Reasons for) leaving the agricultural sector, especially within family holdings

In the majority of the case study regions farming is not seen as economically viable, resulting in young people leaving the agricultural sector even within family holdings. In **Podlaskie**, even farming families, in which young members value the farming tradition, are forced to leave for urban centres due to a lack of social services and economic viability of the farming sector. Quality of life in rural areas is seen as a major reason for young people leaving the farming sector, as exemplified in **Podlaskie**, **South-west Oltenia**, and **Upper-Austria**. As highlighted in **Upper-Austria,** the increase in average age has multiple typical follow-up effects such as the reduction of infrastructure geared towards younger people (e.g. childcare facilities, primary schools, sports facilities) and insufficient investment in public services, all of which lead to a reduction in quality of life for rural areas and further exacerbate the issue.

In **Brandenburg,** the perceived low wage of the agricultural sector and increased quality of life in the nearby urban centre in Berlin are a significant contributor to leaving the region.

(e) Changes in farming wages and income

While wages have been increasing in many of the regions, overall the disparity between wages in the primary sector and other sectors across the case study regions is seen as a major issue. In **Campania,** although farming wages have been increasing, comparatively even within the sector, agricultural wages remain below the national average. Such findings may help to explain the larger drop in agricultural employees witnessed in the region, and the scarce presence of young people employed. In **Podlaskie,** the low regional GVA is attributed to the higher prevalence of agricultural jobs. In **Aragon,** agricultural wages must now meet a minimum of € 900 per month, due to national regulation. On the one hand, this is an encouraging observation. On the other hand, it has been a contested topic due to concerns over the economic implications, in particular for seasonal work. In **Aragon**, the continuity and profitability of farms is limited and relies heavily on trying to guarantee the lowest possible wage costs, especially in fruits growing farms.

(f) Pluriactivity and farm diversification (and their role in supporting farmers' income)

Pluriactivity and farm diversification is seen as a positive trend and one way of palliating the issue of economic stagnation in the primary sector, also contributing to regional diversity. This trend can be divided into two broad categories, diversifying employment into other areas, by e.g. contracting on other farms or taking up employment in other sectors (pluriactivity) and diversifying the farm model into new sectors such as on-farm processing or agritourism (diversification). The incidence of pluriactivity and farm diversification has been on the rise in many of the case study regions (including Campania, Aragon, South-west Oltenia, and Southern and Eastern Ireland), and is seen as an important development targeted by various local institutional actors. In the Italian agricultural sector OGA has been on a steady increase. The incidence of OGA in **Campania** is increasing and roughly one-third that of Italy. In **Corsica,** almost two-thirds of farms holders market part of their production (except wine) in short food supply chains and therefore considerably increase their revenues. Notably, in **Aragon,** the number of holdings with activities linked to tourism approximately tripled between 2003 and 2007 – but then decreased so that overall, the number of holdings with activities linked to tourism approximately doubled between 2003 and 2016. Similarly, in **South-West Oltenia** the number of farms with other gainful activities has increased over the analysed period. In **Southern and Eastern Ireland,** albeit on the rise, a limiting factor to farm diversification is the limited and dispersed nature of the population, and limited levels of visitors. In **Podlaskie,** pluriactivity and diversification of income, especially through agritourism, is seen as a solution that can help diversify economy as well as contribute to maintaining employment and promoting generational renewal in agriculture. Despite this, local authorities provide no specific measures or substantial funds to support these efforts. Advisory services and networks provide support, however, operate on a voluntary and non-profit basis limiting their effectiveness. The fragmentation of the government efforts decreases the effectiveness of addressing such problems. Programming decisions are often made at the national level, overlooking the economic potential and value of "territorial identity", and regional authorities are left with less financial means at their disposal.

(g) Seasonal labour and migrant workers in agriculture (to ensure the viability of farms)

The agricultural sector has experienced an increasing role of foreign workers, especially in the southern regions. Seasonal and migrant workers are now a common feature in many labour-intensive farm enterprises, as exemplified in Campania and Aragon. Conversely, this is not the case in Southern and

Eastern Ireland, South-west Oltenia, and Upper-Austria. Given its proximity to Eastern EU border, Podlaskie has been receiving migrant populations. Since **Podlaskie** is not perceived as an attractive region, migrant populations in the labour-force are not a particularly high priority. In **Campania** and **Aragon,** the demand for agricultural workers is on the rise, especially that of seasonal nature. Seasonal employment pressures which the domestic supply cannot respond to, coupled with a high inflow of migrants, has resulted in an increased importance of migrant workers in these regions, together with the out-farm migration of local workers and young people, looking for jobs in more profitable sectors. Migrant workers are seen as a means of ensuring economic stability and have been used to palliate the agricultural labour market gaps, and to reduce production costs. The social conditions of migrant workers are a significant cause for concern, highlighted in **Campania**, **Aragon** and **Podlaskie** regions, due to legal and social vulnerability, inaccessibility to adequate housing, and often relatively lower education levels. In addition to national regulations, in **Campania** local initiatives such as the association *"Nero e non solo – Black and not alone"* are in place to address migrant worker issues. The main strengths of such initiatives are that they are tailored to local needs and characteristics, involving several stakeholders that operate in the field.

(h) (Potential) contribution of agricultural policies to EU social initiatives (European social dialogue, EU Social Pillar, Europe 2020 Strategy on Growth and Jobs) and the Marrakech declaration on migration

The CAP has overlaps with various aspects of other EU social initiatives, and can in principle be observed to have positive impacts. Certainly, the potential of the CAP to positively impact these aspects is significant and far from exhausted showing considerable potential in the upcoming programming period. In **Campania,** the degree to which EU social initiatives are tailored locally, and in particular, structured to address the needs of migrant workers, offers room for improvement. For example, through a labour standards labelling scheme supported through the CAP, or implemented on an EU level. On the other hand, in **Aragon,** the CAP was argued to support *"patrimonialisation of aids",* in that more than a third of the recipients of the CAP are older than 65 years because of the CAP payments' links to historical rights. As a response, the Aragonese government has been promoting policy adjustments to curb this effect via strong participation in upcoming CAP strategic plans. With respect to migrant populations, in Aragon RDP funding is applied through LEADER projects gathered in the Aragonese Rural Development Network. In **South-west Oltenia,** although RDP measures for addressing social and structural issues are in place and perform successfully, the measures are too small in scale to induce a consistent positive effect. In **Corsica,** glaring disparities in terms of living conditions and social integration subsist between farmers in mountain areas and farmers on the lowlands, raising significant concerns about the maintenance of "rural fabric" in the inner parts of the region. Agricultural policy in **Podlaskie** is dependent on the EU and national policy levels, and decision-making is not allocated to local authorities with an insufficient focus on regional impacts in terms of promoting socio-economic development, resulting in a continued threat to the marginalisation of already vulnerable regions. Overall, the alignment of RDP funds and regional needs and priorities is not necessarily a given, and it is questionable whether there is sufficient exchange and coordination between administrative bodies at different levels in order to provide tailored investments.

5.1.5. Expected developments/impacts of these challenges

(a) Structural changes in the agricultural labour force

Overall, it is expected that farms will continue to concentrate. Mechanisation and intensification of production will continue to increase, albeit at faster rates among larger-sized commercial farms, further

contributing to out-competition with mid-sized, small, and family-based farms. This will contribute to a continued decrease in family-based labour, and increase in part-time and seasonal labour. At the same time, the increase in large-sized, corporate farms entails a demand for more skilled farmers and could, thanks also to potentially more attractive wages, be accompanied by an increase in highly trained, younger farmers.

(b) Structural changes in agricultural markets

The trend in agricultural markets to decrease the costs of products will continue to place pressure on farms to intensify production and decrease input costs. This will affect mid-sized, small, and family-based farms more severely. This also implies that the role of farm diversification and product differentiation will gain in importance for maintaining the competitiveness and income of smaller farms' holders.

(c) Entering the agricultural sector

The relative divide between the primary sector, and the secondary and tertiary sectors continues to increase. In combination with increases in land prices, and issues with hand-off, and insufficient social services and infrastructure, the population entering the agricultural sector will likely continue to decrease.

(d) Leaving the agricultural sector

Out-migration from rural areas due to limited employment opportunities, social services, infrastructure, and quality of life is expected to continue (Podlaskie, Campania, Aragon, South-west Oltenia, Brandenburg). This trend is accelerated in regions near urban centres with strong economic opportunities and services. This observation creates a multiplier effect further reducing diversity and opportunities in rural regions (Upper-Austria), and encouraging higher rates of leaving the agricultural sector.

(e) Changes in wages and income

Continued strain is expected in the agricultural sector to meet wage regulations, attract workers, and maintain profitable farm income. In the context of pressure to decrease production costs, policy instruments tailored to regional needs will be paramount in curbing such negative effects, particularly among mid, small, and family-based farms.

(f) Pluriactivity and Farm diversification

Pluriactivity and farm diversification is expected to continue to increase, particularly among mid-sized, small and family-based subsistence farms as income from farming alone among these groups is often inadequate. Agritourism is seen as one important way to increase farm-level pluriactivity and reinforce the attractiveness of the region. Currently, the major source of pluriactivity among farming populations continues to be contracting labour and services to other farms. Shifting to a strong focus on farm diversification such as on-site processing, agritourism, and others, will require significant investments in land, infrastructure, marketing channels and education, and therefore can be expected to be observed at different rates among the regions. A regional focus, and strong regional participation, in contributing to policy efforts is stated as an important aspect.

(g) Seasonal labour and Migration

Seasonal labour and migration are expected to increase among the case study regions. Increased support tailored to the local level, to improve quality of life for seasonal and migrant labourers, address workers' rights imbalances, and ensure that mid, small and family-based farms are equally able to access, register, and finance additional labour during peak periods, is required with efforts already observed in regions such as Campania and Aragon.

5.1.6. Prospects of farming employment in the EU post 2020

The forecast analysis points to **further consolidation** across the farming sector. Smaller farms will likely continue to decline in numbers as larger farms (utilised agricultural area in excess of 100ha) grow in numbers. Overall, the workforce directly employed in the sector will continue to contract, a forecast in line with the agricultural outlook published by the European Commission (2017;2018). The European Commission's report also expects a **further technological re-focusing** of the sector steering labour costs and demand for skilled farmers upwards, to which agricultural labour markets in older Member States seem to be more prepared. Family workers are also expected to continue to decline. The loss of labour is likely deeply connected to relatively more attractive working conditions and incomes in other economic sectors, but also to the deficient availability of public services in rural areas (European Commission, 2017). **Seasonal workers** will likely grow in importance as the regular labour force in the sector continues to diminish. Finally, **ageing of farm managers** and associated problems will worsen, as labour outflows exceed inflows into the sector and young farm managers continue to dwindle – across the vast majority of EU regions.

5.2. Conclusions and recommendations

5.2.1. Conclusions

Regular labour force in the farming sector is rapidly shrinking in the EU, both in AWUs and number of persons. Family workers still represent the vast majority of agricultural labour in Europe, but this type of labour has been steadily declining for years and is expected to further decline in the near future, as younger generations turn to more economically profitable jobs in other sectors. In that regard, **generational renewal** appears to be one of the major challenges of the farming sector across the EU, driven by two main factors: first, the lack of attractiveness of agricultural jobs and rural areas more broadly for higher-educated younger generations; and second, the lack of incentives for older farmers to retire. Retirement is problematic because agricultural pensions are often too low to guarantee decent living conditions for retirees and CAP direct payments, not linked to agricultural production, encourage older farmers keep their holding and land.

Likewise, the majority of the agricultural workforce (83%) is employed part-time and/or has farming as a secondary activity, mirroring the importance of pluriactivity and farm diversification to secure a stable and liveable income. In 2013, nearly 40% of EU farms were managed by a **pluriactive** farm holder[39]. At the farm level, **diversification** through, for example, the processing and marketing of agricultural products and agritourism, can represent a significant source of additional income. Farm diversification widely contributes to the vitality of rural areas and economies, creating a positive feedback loop of secondary and tertiary effects, leading to more attractive rural areas. However, difficulties in accessing land (e.g. for building tourist accommodation) and credit for investment are prevalent barriers slowing down the pace of farm diversification. In addition, European regions are not equally endowed with favourable conditions for diversification. Some areas have a higher potential for important diversification sectors, such as tourism or certain types of energy production. However, regionally

[39] Source: Eurostat, dataset [ef_ogaft].

tailored diversification can be introduced in almost any rural area, given adequate investments in infrastructure and education.

Technological innovation is another driver of structural changes within farms and agricultural labour markets. By improving agricultural labour productivity, mechanisation reduces the need for human labour while potentially increasing the need for specific skills and training. In that respect, agricultural holdings across Europe are not evenly prepared for taking up **technological innovation,** as the level of agricultural training of farm managers varies considerably from one Member State to another – with some variation within Member States – and as small-sized farms have less capacity to adopt technological innovation and thereby struggle to remain competitive. More generally, the gap between research and innovation, on the one hand, and practical application in the fields, on the other hand, is cited as a constraint to technological advancement within the farming sector.

While the share of foreign workers in the EU agricultural sector remains small (below 5%), **seasonal – and in particular migrant – workers** play a key role in responding to periodic peaks in labour demand that local supply cannot meet. At the same time, the working conditions and socio-economic integration of these workers are of particular concern and so far not sufficiently addressed by institutional frameworks. The potential of the future CAP, and namely Rural Development Programmes, to tackle this issue has been recognised by the European Commission in its Communication on "The Future of Food and Farming" (EC, 2017c).

5.2.2. Recommendations

Building on these findings, and in order to address some of the main issues identified, the 2021-2027 CAP could be pay greater attention to:

- Encouraging **younger generations** to remain in the sector, as well as **new entrants** from outside the farming sector, while in parallel facilitating **generational transfer** by creating favourable conditions for ageing farmers to retire. This encompasses both the facilitation of handing over farms within and outside families[40] including addressing pension and retirement concerns, and the access to financing (venture capital) for young market entrants without securities.
- Promoting **higher quality of rural employment** by investing in diversification and adding value to farming (e.g. by reinforcing the support available for on-farm and post-farm processing activities in rural areas through the RDPs and other policy tools). Diversification can also be synergistic with the main challenges of de-carbonisation and improved sustainability of EU agriculture in the coming 30 years. Greening within EU farming can mean a higher EU added value, a more diverse and efficient sector, and improved job availability and quality within green and smart rural land and resource management. The plans of the upcoming EU programming period however (with its separation of the CAP from the remainder of the Territorial Cohesion Funds [ERDF, CF, ESF, TC[41]]) are not really corroborating this point. The legislative proposals rather give the impression that synergies across sectors in rural areas will be relatively prohibited and that the CAP is still concentrating entirely on one sector – i.e. agricultural basic production.
- Increasing the quality, diversity and levels of rural employment in the future, in a **wider variety** of farming and farming-related roles (e.g. social farming, health therapy, education, energy and waste in the circular economy, etc.). However, the funding framework of the upcoming EU Multiannual Financial Framework has not provided an explicit focus on horizontal territorial development thinking. The encouraging attempts of the ongoing programming period with the establishment of

[40] This of course touches very much upon the competences and legal framework (inheritance law, land ownership regulations) of the Member States, but could probably be influenced by EU Directives.

[41] European Regional Development Fund, Cohesion Fund, European Social Fund, Territorial Cooperation Funds.

CLLD, which fostered such broadening of economic activities in rural areas by the support of multiple ESI funding sources, will become more difficult in the future and run the risk of fading out.

- Improving the **status (including social security and pension) and wages** of farm workers. Similarly as above, the approach relies partly on adding value and increasing farm sector resilience, and also on introducing structural change. This entails a new and stronger focus on training and education at all stages of the career of farming workers and helping farmers to take up technological innovation. Likewise, promoting actions which enable producers to obtain fairer prices for their products in a globalisation context (e.g. through organisation and cooperation) can help in making agriculture a more profitable and more appealing economic sector.
- Supporting a **different restructuring process** when the typical structural change based on farm enlargement, intensification and production specialization are expected to have negative consequences on the rural fabric of the countryside and the environment. This approach seems more in line with emerging future challenges. The recent plans on facilitating access to land by allowing for the support of working capital through Financial Instruments (as stipulated in the upcoming Omnibus Regulation[42]) is actually paving the way to such a development. Land grabbing and concentration of land ownership facilitated by EU funded Financial Instruments are a real threat in this context and should be carefully monitored and prohibited by spatial planning and zoning law in the Member States.
- Raising the **quality of life** in rural areas, in particular by improving the availability and accessibility of public services and infrastructure, so as to retain young farmers and their families.
- Better integrating and coordinating the CAP goals and tools with **EU social policies** and other European Structural and Investment Funds, especially with respect to the migrant workforce – a potential solution to rural depopulation. This could be achieved, for example, through **conditionality of direct payments** linked to the quality of labour conditions, health and safety standards, and compliance with Directive 91/533/EEC.
- Bolstering the **integration of seasonal and migrant workers** into the local community through, for example, Rural Development Programmes, by providing support to both seasonal and migrant workers as well as the "host" population. The basis for this is safeguarded through a proper implementation of Directive 2014/36/EU (*on the conditions of entry and stay of third-country nationals for the purpose of employment as seasonal workers*) which should be better monitored in Member States to ensure minimum standards are achieved.
- Offering more flexibility to fine-tune CAP **Pillar 1** to meet regional needs, and in particular stimulating more agricultural production where production is scant through coupling, at the same time incentivising older farmers to retire and hand over their holding and/or land to younger farmers.
- Tailoring rural development support under **Pillar 2** to the needs and potential of the region/country, focusing namely on rural values, rural fabric and territorial identity as a driver of product differentiation and agritourism (CAP "rooted" in the territory).
- Streamlining the two pillars of the CAP at the territorial level so as to achieve a **common vision and clear objectives** with regard to farming employment – including with more devolution from the national (and regional) authorities to more local authorities for the design of Rural Development Programmes. The elaboration of a single Strategic Plan for the both pillars is a first step towards this.
- Achieving a common and coherent vision of the different programmes set up by the **EU and Member States** focusing on the socio-economic development of rural areas, to help in delivering the ambitious agenda of the new CAP in the context of a foreseeably smaller budget. The lack of a

[42] See https://data.consilium.europa.eu/doc/document/PE-13-2018-INIT/en/pdf

common set of objectives for the overall EU policy post 2020 (comparable to the EU 2020 goals) is representative of not fostering this recommendation. The principle of Territorial Cohesion with its various aspects (mending of economic, social and environmental disparities, balance/ justice, cooperation and governance) may be a common "vision" and umbrella under which all EU co-financed programmes may find a way to support the socio-economic development of rural areas in a synergetic way. With the lack of such a commonly agreed upon vision, and set of goals, its accomplishment could be jeopardized.

5.3. Validation of key findings

Three interviews with key EU stakeholder organisations from the agricultural sector were conducted in order to validate, refine and complement the preliminary conclusions and recommendations of this study. The organisations that have been approached to comment on the findings were the CEJA (the European Council of Young Farmers), COPA COGECA, and the EFFTA (the European Federation of Food, Agriculture and Tourism Trade Unions).

The interviewed organisations overall agreed with the findings, conclusions and recommendations of the study, while introducing some nuances not previously considered and calling for additional elaboration on certain specific points.

For instance, the use of AWUs as a unit of measurement in the quantitative analysis component of this study should not conceal the **large population active in the agricultural sector**, nor the many family members relying on this source of income. It is important to recall that maintaining farming employment has a direct implication for keeping rural economies alive.

In addition, the role of **modern technology** in farming and the challenge for farmers to take up such innovation should not be under-estimated, hence the importance of vocational training, advisory services and knowledge exchange within and outside the framework of the CAP.

Investment for the development of and access to **rural infrastructure and services** was also commonly mentioned as an essential factor of the retention – and expansion – of farming employment.

Likewise, the importance of aligning the CAP with **EU priorities** (e.g. in relation to farming employment and farming business development, green jobs and social cohesion) and achieving an EU-wide coherence of rural development programmes was stressed.

The **seasonal demand for temporary labour** could be further investigated as part of a second study, with a focus on undocumented labourers and undeclared work – and their labour and living conditions – a topic of growing relevance in many European regions.

Farm diversification is indeed a widespread and growing trend in Europe. However, it is difficult to know with precision the current number of diversified farms across the EU and assess how important diversification and pluriactivity is for the farming sector across countries and regions. Apart from the **barriers for further expansion of farms and farm diversification** mentioned in the study, the inability to invest, the need for additional technical expertise and the difficulty linked to running a multi-focus enterprise were mentioned by interviewees as relevant obstacles. In addition, farm diversification into **"green" and bio-economy activities** is another topic of growing interest which was not brought out in detail by this study but deserves attention – in particular with respect to its ties to climate change mitigation strategies.

These aspects of the validation were included in the study (i.e. in fine-tuning the recommendations), while the other aspects pertaining to future research can be considered in upcoming rounds of studies.

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ANNEX A: METHODOLOGY AND APPROACH

A.1 Methodological approach to the structured literature review: impacts of the CAP and theoretical examination of institutional frameworks

Section 2.2 of this study provides the results of a structured review of the literature on the impact of the CAP on agricultural and rural employment, aiming to provide a clearer picture of, and to highlight key messages from, the most recent scientific and policy literature.

The literature search has been developed in two phases. In the first phase (Schuh et al., 2016), keywords, search terms and inclusion and exclusion criteria have been designed. The inclusion criteria, keywords and search terms can be found in the table below. Different combinations of keywords were utilised.

Inclusion criteria	Key words utilised	
) Geographical coverage: countries that are Member States of the European Union and their regions;) Policy: all the measures and instruments of both Pillar I and II of the CAP and all the relevant CAP reforms since 1992;) Outcome: the impact of the CAP on agricultural and rural employment; structural change (entry/exit); the migration of workers from the agricultural sector to other sectors; farmers' time allocation decisions between on- and off-farm work;) Study design: ex-ante and ex-post analyses, as well as quantitative and qualitative analyses.	) employment;) labour;) job;) job creation;) migration;) work;) agriculture;) rural;) development;	) Common Agricultural Policy;) CAP;) pillar;) decoupling;) reform;) European Union;) European Commission;) European Parliament;) EU

The inclusion criteria were combined with exclusion criteria. More specifically, any studies concerning countries that are not EU Member States and any policies different from the CAP were excluded from the review. In addition, studies for which the full text was not available/accessible or which are published in a language different from English or published before 1999 were also excluded.

Using the keywords identified in the table, and inclusion and exclusion criteria, a **first search** of the literature was conducted in February 2016 using the following databases: University of Gloucestershire library database (DISCOVERY); University of Bath library database (PRIMO search); University of East Anglia library database (UEA Library Search); European Commission repository; the Joint Research Centre repository; OECD library; Google Scholar; Agra-Europe; and AgEcon Search. A total of 1370 publications were extracted during the first phase, which included academic articles, newspaper articles, conference proceedings/working papers, government documents and books. After double screening from two different researchers a total of 53 studies were retained in phase one.

The **second phase** consisted of updating the literature search conducted in phase one. In July 2019 a second search for the years 2016-2019 was performed using the same keywords, databases and inclusion and exclusion criteria of phase one. After double screening, this second search yielded 12 additional studies, made up of 7 academic articles, 2 book chapters and 2 reports. The literature collected through both phase one and two, consisting of a total of 64 studies, is discussed below.

A.2 Methodological approach to forecast estimation

The data used for the analysis presented in Sections 3.1 and 3.3 of this study was, for the most part, taken from the **CAP context indicators**[43] where data is collected in some years only (2003, 2005, 2007, 2010, 2013 and 2016). In order to draw historic lines and forecast future values, missing values had to be estimated. Missing values in time series were estimated in R by using the Package *"imputTS"*[44]. The package provides a collection of algorithms for time series imputation. For this analysis we used the spline interpolation. Advantages of spline interpolation in comparison with usual interpolation methods are the convergence and stability of the computing process[45].

Time series forecast analysis was conducted by using the R Package *"forecast"*[46] and by applying the function *"auto.arima"* which returns the best ARIMA (auto-regressive integrated moving average) model according to either the AIC[47], AICc[48] or BIC[49] value.

A confidence interval is the probability that a value will fall between an upper and lower bound of a probability distribution. In this case, the probability set for the two confidence intervals displayed around the forecasts trend line is 70% and 95%, respectively.

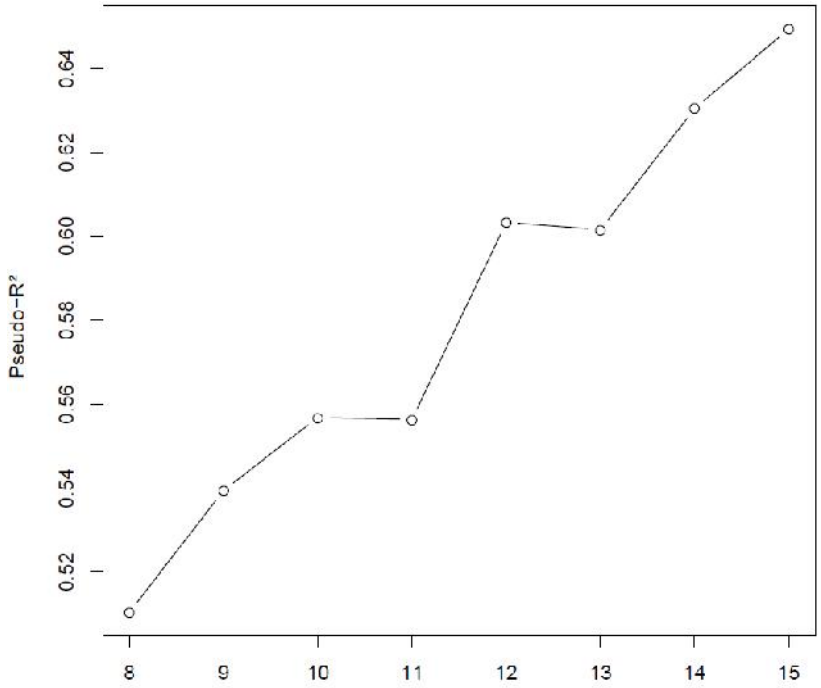
A.3 Methodological approach to the clustering exercise

As described in Section 3.1, clustering is about grouping individuals (e.g. European cities, regions or countries) into a limited number of distinct batches (or *"clusters")* based on a set of characteristics (e.g. territorial, socio-economic, demographic and/or other thematic characteristics). These characteristics are each represented by a dedicated "indicator" (i.e. a quantifiable variable) in the clustering exercise.

Technical implementation of the clustering exercise

The programme used for the clustering presented in this study was R. Due to missing values for some regions, the clustering method used was the *"kpods"* method applied to the standardised dataset of observations. The chart below (representing the *"kpods goodness")* tends to indicate that setting the desired number of clusters to 11 instead of 10 or to 13 instead of 12 does not increase the explanatory power of the model; in contrast, having 9, 10 or 12 clusters appear to be statistically more valuable than 8, 9 or 11, respectively.

43 This series of statistics is available at: https://ec.europa.eu/agriculture/cap-indicators/context/2018_en
44 Moritz and Gatscha (2019): Package „imputTS": https://cran.r-project.org/web/packages/imputeTS/imputeTS.pdf
45 Researchgate (Posts from 2018): *What the best for interpolation, Lagrange or spline?*
Available at: https://www.researchgate.net/post/What_the_best_for_interpolation_Lagrange_or_spline
46 Hyndman et al. (2019): Package „forecast". Available at: https://cran.r-project.org/web/packages/forecast/forecast.pdf
47 AIC stands for Akaike information criterion and is an estimator of the relative quality of statistical models.
48 AICc is a modification of AIC for small sample sizes.
49 BIC stands for Bayesian information criterion and can also be used for model selection.



Considering the number of case studies to be performed in this study (between 6 and 8) and the distribution of regions into the 9, 10 and 12 clusters respectively, it was decided to retain 10 clusters from which to choose 1 case study region, except for the two clusters which naturally tended to draw the more urbanised, less agriculture-oriented regions.

Limitations

As in all types of quantitative analyses using different sources of data, a number of shortcomings related to data quality and/or data availability limits the robustness of the clustering outputs, however without undermining its validity.

To the extent possible, indicators with complete datasets at NUTS 2 level have been selected, so as to use "true" values as far as possible. For some highly relevant indicators however, data was partly or entirely missing at NUTS 2 level, hence the need for estimation. More specifically, data available at NUTS 0 or NUTS 1 level only was *"broken down"* to NUTS 2 level using a suitable proxy variable (i.e. a variable that is fitting with the "incomplete" indicator while being different from all clustering indicators). The estimation technique is based on *proportion* calculations, with the proxy variable used as the weighing coefficient.

For a few NUTS 2 regions, namely the outermost regions of the EU, data gaps were extensive across the majority of indicators, so that they were removed from the clustering sample. The sample of the clustering exercise included 266 NUTS 2 regions using the NUTS 2013 classification.

To the extent possible, only recent data has been used for populating the chosen indicators with corresponding values. For a limited number of indicators though, only data before 2016 was available. For some of these indicators, the values are deemed to be pretty constant over time (e.g. land cover use, accessibility), but for some other (e.g. patent applications, structure of the agricultural labour force), current values may be relatively different to what they were in the reference year – the case studies will pay particular attention to the current picture of agricultural labour force in a representative sample of farming regions.

ANNEX B: CASE STUDIES (VOLUME II)

- Romania
- Poland
- Italy
- Spain
- Ireland
- France
- Austria
- Germany

This study outlines the current trends and patterns of farming employment in the EU and discusses possible development paths for the European agricultural labour force.

In particular, this study investigates the drivers of and structural changes within agricultural labour markets at regional, national and EU level, building on a range of quantitative and qualitative analysis methods.

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