



FARCLIMATE

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Sustainability
Assessment in Practice:
Case Studies. Version 1

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List of acronyms

EEA: European Environment Agency

ENoLL: European Network of Living Labs

EU: European Union

GDP: Gross Domestic Product

IPCC: Intergovernmental Panel on Climate Change

IUCN: International Union for Conservation of Nature

NbS: Nature-based Solutions

NUTS: Nomenclature Of Territorial Units for Statistics

PPS: Purchasing power standard

WP: Work Package

Project information

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Draft_V0.1	10/10/2025	First draft
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Executive Summary

This report establishes a critical baseline analysis of shared socioeconomic trends across the diverse European territories hosting the FARCLIMATE project's case studies. As the first in a series of key deliverables, its purpose is to provide a foundational, macro-level characterisation of the social and economic trends in which local climate adaptation initiatives will unfold. This initial, broad-scope assessment validates initial assumptions and ensures that subsequent, granular analyses to characterise the case studies further or to inform WP6.

Our methodology was built on a robust, reproducible data collection process (Section 2). This design preserves scalability and transparency for future updating and dashboarding. The analysis was conducted at the NUTS 3 level, offering the most granular detail for consistent cross-European comparison. We systematically collected and curated a wide range of indicators from Eurostat, selected for their recurrency, timeliness, and comparability. The indicators cover topics across demography, economic accounts, business demography, tourism, transport, and energy for the 27 territories associated with the project's case studies.

Section 3 synthesises shared trends across the previous domains: demographic (fertility, ageing, migration), economic-demographic (working-age cohort and employment), economic (GDP, GDP per capita, PPS convergence), primary sectors (employment, gross value added), tourism (guest nights spent) and energy (heating and cooling degree days).

Section 4 consolidates seven trends, links them to the case study risks described in D2.5, and discusses implications for climate change adaptation. Specifically, the synthesis reveals the following seven key socioeconomic trends that are broadly shared across the diverse case study territories:

1. The growing employed population as a potential demographic baseline: Employment rises in most territories despite shrinking working-age cohorts, suggesting a tight labour market that could help stabilise demographic decline.
2. Growing increased value in the primary sectors: Most territories are experiencing an increase in the gross value added from agriculture, forestry, and fisheries, indicating a shift towards higher-value production and increased productivity.
3. Population ageing: A combination of low fertility rates and a shrinking youth population is driving a consistent trend of population ageing across nearly all regions.
4. Migration as a demographic counter: Net migration turns positive in most places, partially offsetting natural decline but rarely reversing it or reshaping local age structures.
5. Tourism as a diversification opportunity that also presents social and environmental challenges.
6. Shifting energy demand: Cooling degree days rise while heating degree days fall, shifting seasonal energy needs and resilience priorities.
7. Economic convergence with Europe is barely happening: Despite GDP growth, most low-income territories do not close the gap with the EU average, while mid-tier regions are slipping and affluent regions are maintaining their advantages.

1 Introduction

This report is the first in a series of key deliverables (D3.2, D3.3, and D3.4) for WP3. It provides a foundational characterisation of the socioeconomic trends across the FARCLIMATE project's case studies, setting the stage for subsequent, in-depth impact assessments.

Our project plan mandates a comprehensive, multi-stage approach to integrated assessment. A robust analysis cannot be imposed top-down; it must be built upon the specific realities of each local context. Consequently, our initial strategic priority has been the crucial work of launching and operationalising our network of case studies through the Living Lab methodology. This establishes the essential groundwork for future analysis, ensuring that our subsequent assessments are directly relevant to the unique challenges and potential solutions prioritised by the stakeholders on the ground.

With this foundational work now complete, our case studies are positioned to begin devising solutions tailored to the climate challenges they face. The detailed assessments outlined in the project proposal—including the economic value chains (T3.2), the social analysis of wellbeing (T3.3), and the environmental analyses (T3.5)—are contingent on the development of these specific interventions. The granular data required for these in-depth analyses will be generated as the case studies progress.

Therefore, the scope of this initial report is deliberately broad, focused on the whole group of case studies. We provide a comparative analysis that juxtaposes broad, macro-level socioeconomic trends drawn from Eurostat regional statistics with the specific, ground-level risks identified by the case studies themselves. This approach allows us to validate initial assumptions and understand how overarching dynamics across territories may influence local climate adaptation efforts.

The strategic value of this assessment extends beyond supporting the case study's specific efforts. For WP6, this analysis provides a base for two key goals. Firstly, it informs the road-mapping of political strategies and policy recommendations that are sensitive to regional socioeconomic contexts. Secondly, identifying common risks and opportunities helps build the cohesive foundation necessary for engaging the case studies within the European Climate-Resilient Communities' Network.

This document, therefore, serves as the analytical baseline for the targeted assessments to come. Further findings from the socioeconomic trends will be reported in subsequent deliverables as the case studies mature and their work on challenges and solutions advances.

The rest of the document describes the collection of data for the socioeconomic analysis (Section 2), analyses shared socioeconomic trends (Section 3), and concludes with a synthesis and discussion of these key trends (Section 4).

2 Collection of socioeconomic data for cross-comparison

2.1 Selection of NUTS 3 as the analytical level

The chosen level of analysis for this report is the NUTS 3 (Nomenclature of Territorial Units for Statistics, level 3) classification. This level was selected because it offers the most granular detail available for consistent comparison across European countries.

While NUTS 3 provides high detail, its application varies. The definition of a NUTS 3 region can range from large supramunicipality entities (e.g., in Portugal and Finland) to subregions (e.g., in Poland). They often correspond to national administrative units, such as Dutch provinces (first-level) or Spanish and Italian ones (second-level). Demographically, the target population for a NUTS 3 region is between 150,000 and 800,000, but major metropolitan areas significantly exceed this, including Madrid (6.7 million), Barcelona (5.7 million), and Rome (4.2 million). In some cases, different NUTS levels may even cover the same territory, as seen in Prague, Brussels or Madeira.

Although NUTS 2 regions offer more comprehensive statistics, and some project case studies may span a NUTS 2 region, the NUTS 3 level was deemed essential for achieving the cross-regional comparative objectives of the FARCLIMATE project.

2.2 Socioeconomic dataset selection

Based on the selection of the NUTS 3 level, the primary socioeconomic dataset chosen is the Eurostat collection *Regional Statistics by NUTS classification (reg)*. This dataset was selected based on the following key criteria:

- **Recurrency:** It provides indicators that are updated regularly, mainly on an annual basis.
- **Timeliness:** The dataset contains recent data (2022 onwards) for the majority of its indicators.
- **Comparability:** It enables direct statistical comparison between the different territories of the FARCLIMATE case studies and candidate regions.
- **Scalability:** It facilitates the analysis of other European regions, supporting future expansion with new case studies or collaborations with similar initiatives.
- **Accessibility:** Eurostat datasets are freely and easily accessible.

This foundational dataset provides a consistent baseline for comparison. However, further socioeconomic analysis may be conducted for individual cases, tailored to the specific needs, information availability, and the unique problems or solutions being addressed within each case study.

The table below details the indicators and datasets selected from the Eurostat collection *Regional Statistics by NUTS classification (reg)*.

Table 1. Selection of indicators and datasets from the Eurostat collection Regional Statistics by NUTS classification (reg).

Category	Eurostat dataset		Indicators
Agriculture	<i>Not included. Eurostat regional agriculture datasets are disaggregated to the NUTS3 level; however, there is no current and recurrent data collection.</i>		
Demography	Population density by NUTS 3 region		Persons per square kilometre.
	Fertility indicators by NUTS 3 region		Number. Total fertility rate
	Population on 1 January by broad age group, sex and NUTS 3 region		Number. Total. From 15 to 64 years
	Population structure indicators by NUTS 3 region		Year. Median age of population
			Percentage. Proportion of population aged 0-19 years
			Percentage. Proportion of population aged 65 years and more
	Population change - Demographic balance and crude rates at regional level (NUTS 3)		Crude rate of net migration plus statistical adjustment
			Crude rate of total population change
			Population on 1 January - total
			Crude rate of natural change of population
Economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region		Million euro
			Euro per inhabitant
			Euro per inhabitant in percentage of the EU27 (from 2020) average
			Million purchasing power standards (PPS, EU27 from 2020)
			Purchasing power standard (PPS, EU27 from 2020), per inhabitant
			Purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average
	Gross value added at basic prices by NUTS 3 region		Current prices, million euro. Total - all NACE activities
Education	Employment (thousand persons) by NUTS 3 region		Current prices, million euro. Agriculture, forestry and fishing
			Thousand. Total - all NACE activities. Employed persons
			Thousand. Agriculture, forestry and fishing. Employed persons
Science and Technology	<i>Not included. Eurostat regional science and technology datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level. Patents are disaggregated to the NUTS3 level; however, there is no current and recurrent data collection</i>		
Business Demography	Business demography and high-growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations).	Enterprises - number
			Enterprise births - number
			Size of newly born enterprises - persons employed in newly born enterprises divided by enterprise births - average number
			Employment in enterprise deaths - persons employed in enterprise deaths divided by enterprise deaths - average number
			Enterprise deaths - number
			Size of 3-year-old enterprises - persons employed in enterprises newly born 3 years back and survived divided by the same enterprises - average number
			Enterprise survivals (3-calendar year survival only) - number
			3 years old survived enterprises share of the business population - percentage
			Survival rate - 3 years old enterprise survivals divided by enterprise births three years ago - percentage
			High-growth enterprises measured in employment - number
			Share of high growth enterprises, measured in employment - high growth enterprises divided by active enterprises with at least 10 employees - percentage
			Business churn - birth and death rate - percentage
			Birth rate - enterprise births divided by active enterprises - percentage

Category	Eurostat dataset	Indicators
		Death rate - enterprise deaths divided by active enterprises - percentage Net business population growth - percentage Persons employed - number Persons employed in newly born enterprises - number Employment share of enterprise births - persons employed in newly born enterprises divided by persons employed in active enterprises - percentage Persons employed in enterprise deaths - number Persons employed in enterprises survivals (3-calendar year survival only) - number Persons employed in enterprises survivals, in the year of birth (3-calendar year survival only) - number Employment share of enterprise deaths - persons employed in enterprise deaths divided by persons employed in active enterprises - percentage Employment share of 3-year-old enterprises - persons employed in enterprises newly born 3 years back and survived, divided by persons employed in the population of active enterprises - percentage 3 years old survived enterprises employment growth rate - persons employed in enterprise 3 years survivals divided by persons employed in the same enterprises in the year of birth - percentage Employees - number Employees in newly born enterprises - number Employees in enterprise deaths - number New enterprise paid employment rate - employees in newly born enterprises divided by persons employed in newly born enterprises - percentage
Health	<i>Not included. Eurostat regional health datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level.</i>	
Tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards) Guest nights spent at short-stay accommodation offered via collaborative economy platforms by NUTS 3 region - experimental statistics	Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total Number. Domestic country. Nights spent Number. Foreign country. Nights spent Number. Total. Nights spent

Category	Eurostat dataset	Indicators
Transport	National road freight transport by region of loading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Total transported goods
		Thousand tonnes. Products of agriculture, hunting, and forestry; fish and other fishing products
		Thousand tonnes. Food products, beverages and tobacco
		Thousand tonnes. Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
	National road freight transport by region of unloading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Total transported goods
		Thousand tonnes. Products of agriculture, hunting, and forestry; fish and other fishing products
		Thousand tonnes. Food products, beverages and tobacco
		Thousand tonnes. Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
Labour market	<i>Not included. Eurostat regional labour datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level.</i>	
Labour costs	<i>Not included. Eurostat regional labour datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level.</i>	
Digital economy	<i>Not included. Eurostat regional digital economy datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level.</i>	
Energy	Cooling and heating degree days by NUTS 3 region - annual data	Number. Heating degree days
		Number. Cooling degree days
Poverty and social exclusion	<i>Not included. Eurostat regional digital economy datasets with current and recurrent data collection; however, they are not disaggregated to the NUTS 3 level.</i>	
Crime	<i>Not included, the dataset police-recorded offences deemed not relevant for the purposes of this study.</i>	

2.3 Selection of territories for the case studies

The next step was to identify the NUTS 3 territories to include in the analysis, based on the areas where the FARCLIMATE case studies operate. In some cases, the area spans a territory equivalent to a NUTS 2. NUTS 3 databases also provide data at an aggregated level, so in cases where they operate in a NUTS 2 area, we collected the data at that level.

The rest of this subsection lists the NUTS 3 and 2 territories of the 21 selected case studies, with their codes and changes across different NUTS revisions (usually every three years).

Case study 1 – Ría de Pontevedra (1st wave, Spain)

NUTS 3: ES114 "Pontevedra" (NUTS 1999 onwards).

Case study 2 – Ría de Arousa (1st wave, Spain)

NUTS 3:

- ES111 "A Coruña" (NUTS 1999 onwards).
- ES114 "Pontevedra" (NUTS 1999 onwards).

Case study 3 – Mediterranean rural Spain (1st wave, Spain)

NUTS 3:

- ES615 "Huelva" (NUTS 1999 onwards).
- ES618 "Sevilla" (NUTS 1999 onwards).

In D2.5, we broadly identify the case with NUTS 2 ES61 "Andalucía" and ES43 "Extremadura". However, to have a more precise socioeconomic picture, we decided to refine the scope of analysis to the two Andalusian provinces where the bulk of the case study is taking place: Huelva and Sevilla.

Case study 4 – Fundão (1st wave, Portugal)

NUTS 3:

- PT196 "Beiras e Serra da Estrela" (NUTS 2024), coded PT16J in NUTS 2013-2021. PT16J is the result of the fusion of PT167, PT168 and PT16A (NUTS 2003-2010), respectively PT127, PT128 and PT12A in NUTS 1999. In 2013, the merger of PT167's "Oliveira do Hospital" municipality was integrated into PT16E. As such, the former three NUTS 3 combined have 9,22% more population and 4,19% more area than the current PT196.

Case study 5 – Growing Cities Lab, Torino (1st wave, Italy)

NUTS 3:

- ITC11 "Torino" (NUTS 2003 onwards), former IT111 in NUTS 1999.

Case study 6 – Tarczyń (1st wave, Poland)

NUTS 3:

- PL913 "Warszawski zachodni" (NUTS 2016 onwards). In NUTS 2016, PL12A was split into PL913 and PL926 "Żyrardowski". PL12A "Warszawski zachodni" (NUTS 2006-2013) has 35.32% more population and 102.96% more area than the current PL913. In NUTS 2006, PL126 was split into PL12A and PL129 "Warszawski zachodni". PL126 "Warszawski" (NUST 2003) has 131.30% more population and 229,80% more area than the current PL193.

Case study 7 – Málaga (1st wave, Spain)

NUTS 3:

- ES617 "Málaga" (NUTS 1999 onwards).

Case study 8 – Rebollo in Castilla y León (1st wave, Spain)

NUTS 2:

- ES41 "Castilla y León" (NUTS 1999 onwards).

This case study focuses on a regional level in Castilla y Leon; therefore, we focus the territorial analysis at the NUTS 2 level.

Case study 9 – Gorenjska Region (selected for 2nd wave, Slovenia)

NUTS 3:

- SI042 "Gorenjska"/"Upper Carniola" (NUTS 2013 onwards), formerly coded as SI022 (NUTS 2006-2010) and SI009 (NUTS 2003).

In D2.5, we broadly identify the case with NUTS 3 SI042 Gorenjska (Upper Carniola) and SI041 Osrednjeslovenska (Central Slovenia). However, to have a more precise socioeconomic picture, we decided to refine the scope of analysis to Gorenjska, where the bulk of the case study takes place.

Case study 10 – Vlore (selected for 2nd wave, Albania)

NUTS 3:

- AL035 "Vlorë" (NUTS 2016 onwards).

Case study 11 – Sicily (selected for 2nd wave, Italy)

NUTS 3:

- ITG14 "Agrigento" (NUTS 2003 onwards), former ITA04 (NUTS 1999).
- ITG11 "Trapani" (NUTS 2003 onwards), former ITA01 (NUTS 1999).

Case study 13 – Radiata pine in the Basque Country (selected for 2nd wave, Spain)

NUTS 2:

- ES21 "País Vasco" (NUTS 1999 onwards).

This case study aims at a regional level in the Basque Country; therefore, we focus the analysis on the NUTS 2 level.

Case study 14 – Kaem (selected for 2nd wave, Greece)

NUTS 3:

- EL653 "Lakonia, Messenia"/"Λακωνία, Μεσσηνία" (NUTS 2013 onwards). EL653 is the result of the fusion of EL254 "Lakonia"/"Λακωνία" and EL255 "Messenia"/"Μεσσηνία" (NUTS 2010), formerly coded as GR254 and GR255 respectively (NUTS 1999-2006).

Case study 15 – EXO (selected for 2nd wave, Italy)

NUTS 3:

- ITF51 "Potenza" (NUTS 2003 onwards), former IT921 (NUTS 1999).

Case study 18 – SUSGRASS (selected for 2nd wave, Finland)

NUTS 3:

- FI1DB "Pohjois-Savo" (NUTS 2010 onwards), former FI1D2 (NUTS 2010-2021) and FI132 (NUTS 1999-2006).

Case study 17 – Alcornocales Natural Park (selected for 2nd wave, Spain)

NUTS 3:

- ES612 "Cádiz" (NUTS 1999 onwards).
- ES617 "Málaga" (NUTS 1999 onwards).

Case study 19 – Portosanto (selected 2nd wave, Portugal)

NUTS 3:

- PT300 “Região Autónoma da Madeira” (NUTS 2003 onwards), formerly coded as PT3 (NUTS 1999). It matches in territory with NUTS 2 PT30 and NUTS 1 PT3, both also named “Região Autónoma da Madeira”.

Case study 20 – Vaia Strom (selected for 2nd wave, Italy)

NUTS 3:

- ITH20 “Trento”/“Trentino” (NUST 2010 onwards), formerly ITD20 (NUTS 2003-2006) and IT312 (NUTS 1999). It matches in territory with NUTS 2 ITH1 “Provincia Autonoma di Trento”.
- ITH10 “Bolzano-Bozen”/“Alto Adige”/“Südtirol”/“South Tyrol” (NUST 2010 onwards), formerly ITD10 (NUTS 2003-2006) and IT311 (NUTS 1999). It matches in territory with NUTS 2 ITH1 “Provincia Autonoma Bolzano/Bozen”.

This case study aims at a regional level in Trentino-Alto Adige/Südtirol. This region has the particularity of having two NUTS 2 with two matching NUTS 3 territories. As such, we focus the analysis on the NUTS 3 level.

Case study 21 – Emilia-Romagna Region (selected for 2nd wave, Italy)

NUTS 3:

- ITH56 “Ferrara” (NUTS 2010 onwards), former ITD56 (NUTS 2003 and 2006) and IT406 (NUTS 1999).
- ITH57 “Ravenna” (NUTS 2010 onwards), former ITD57 (NUTS 2003 and 2006) and IT407 (NUTS 1999).
- ITH58 “Forlì-Cesena” (NUTS 2010 onwards), former ITD58 (NUTS 2003 and 2006) and IT408 (NUTS 1999).
- ITH59 “Rimini” (NUTS 2010 onwards), former ITD59 (NUTS 2003 and 2006) and IT409 (NUTS 1999).

In D2.5, we broadly identify the case with NUTS 2 ITH5 “Emilia-Romagna”. However, we can further refine the scope of analysis to the four coastal provinces of that region.

Case study 24 – Abruzzo (selected for 2nd wave, Italy)

NUTS 3:

- ITF11 “L’Aquila” (NUTS 2003 onwards), former IT711 (NUTS 1999).

Case study 25 – Focșani (selected for 2nd wave, Romania)

NUTS 3:

- RO226 “Vrancea” (NUTS 2006 onwards), former RO026 (NUTS 2003).

2.4 Data collection and preparation

The data collection for this project has been designed and implemented using R, a statistical programming environment widely used in research, public administration, and business analytics. R provides a robust and transparent way to gather, process, and organise regional data, ensuring the analysis is repeatable and consistent over time.

R was selected for several reasons. First, it offers built-in tools and dedicated libraries for directly accessing and working with official European statistics. In particular, the *eurostat*, *regions*, and *nuts* packages make it straightforward to retrieve and process datasets structured according to the NUTS classification employed by Eurostat.

For users who may not be familiar with data analysis tools, R may appear complex at first glance, but its advantages are significant for this type of work:

- It allows automated data retrieval from Eurostat, which reduces manual effort and minimises the risk of errors when downloading and processing data through spreadsheets. This is especially relevant to cases, like this, in which we download several datasets.
- It provides a transparent workflow, where every step from downloading to preparation of tables is recorded in the code, ensuring that results can be audited or reproduced at any time.
- Once the data collection code has been written, updating our database regularly (e.g., quarterly or annually) requires minimal effort. This supports the long-term sustainability of monitoring and reporting activities.
- It also facilitates exporting the cleaned data to more familiar formats, such as Excel or CSV files, allowing those who prefer spreadsheets to work with the same data in a more accessible environment.

The process of data collection and preparation in R, which we designed, is smooth and systematic. Specifically, the code automatically creates two main types of tables that support different analytical needs:

- "Tidy" tables: These tables follow the principles of tidy data, where each row represents an observation (e.g., a socioeconomic indicator for a specific region and year), and each column represents a variable. This format is optimal for performing statistical analyses and modelling.
- Wide tables: These tables present all observations for a given year in a single row, with separate columns for each indicator. This format is particularly convenient for data visualisation or dashboards, where data for a single point in time is viewed side by side.

Annexe 1 provides the R code for the data collection and preparation of this assessment.

Annexe 2 provides an example of the type of table the code produces, with indicators produced for each NUTS 3 and 2 territory analysed.

3 Analysis of shared socioeconomic trends

An analysis of the data reveals several major socioeconomic trends across the different territories, most of which are global European trends. Although this constitutes an initial descriptive analysis, its primary goal is to confirm significant socioeconomic trends shared across most territories in the FARCLIMATE case studies. This study employs a descriptive approach to systematically identify, compare, and interpret prevailing trends across the 27 territories included in the analysis. The macro-level analysis is well-suited for identifying significant, overarching dynamics that influence the territories in which the climate adaptation initiatives of the case studies will occur. While this approach has inherent limitations, such as data gaps for specific territories or sectors, and does not capture the full granularity of local conditions, it is sufficiently robust for establishing a baseline understanding of key demographic, economic, and social forces at play. This high-level view is crucial for validating initial assumptions and ensuring that the solutions developed within the living labs are grounded in the broader realities of their respective territories. Furthermore, this analysis can inform the identification of diversification opportunities, political recommendations, or other important insights for the living lab communities.

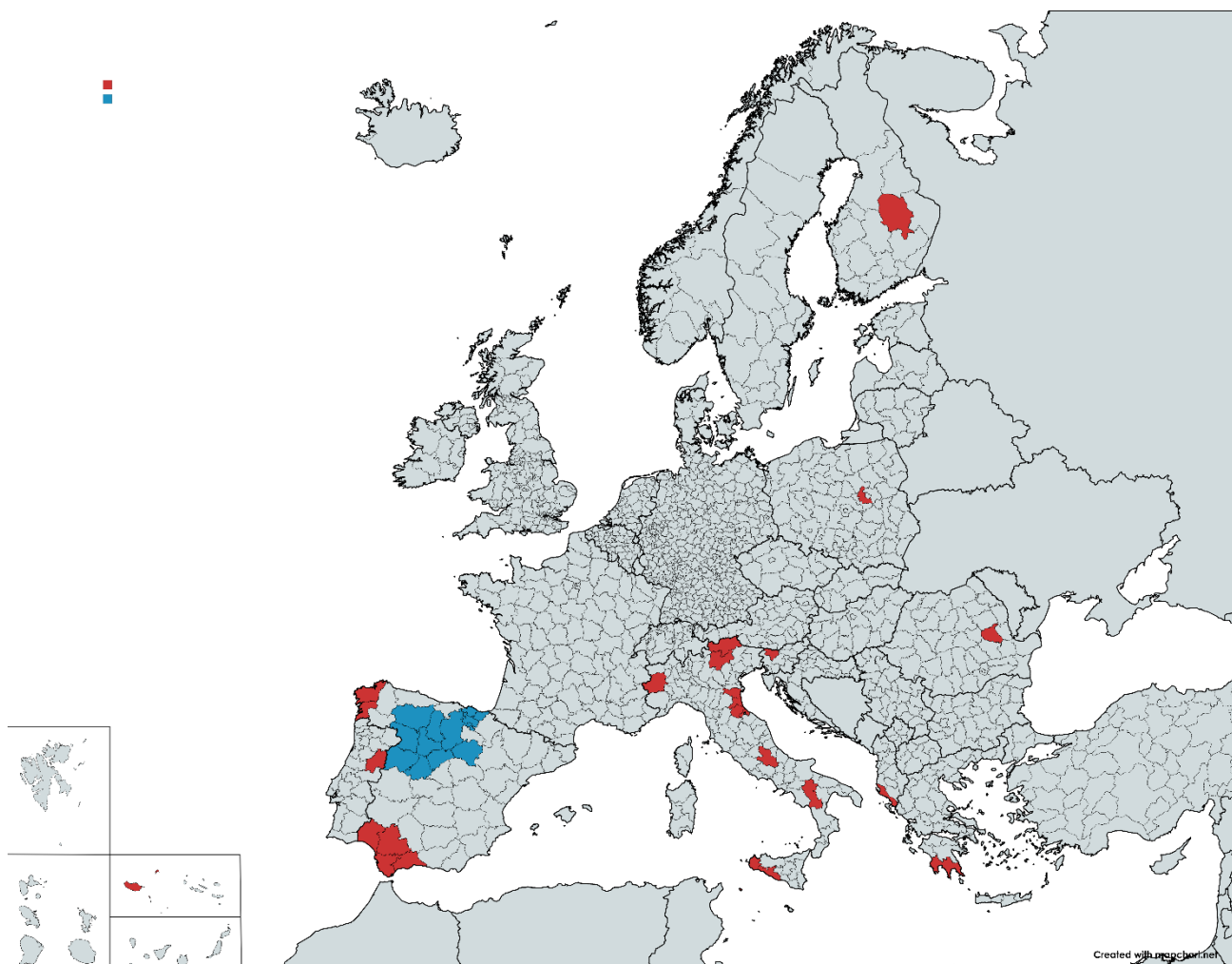


Figure 1. NUTS 3 (red) and NUTS 2 (blue) territories of the FARCLIMATE case studies analysed (map made with MapChart.net, 2025).

3.1 Relevant demographic trends

The total fertility rate is in decline in most territories (81.48%). The fertility rate is the average number of children a woman would have during her lifetime, based on the fertility rates by age for a given year. The only relatively noticeable gains between 2017 and 2023 are in Beiras e Serra da Estrela, from 1.19 to 1.37 and Madeira, 1.15 to 1.22. Agrigento, Trapani and Lakonia-Messina also had small gains. In addition, only three regions have a fertility rate above 1.5, and three have a rate of 1 or below.

Table 2. Total Fertility rate in selected NUTS regions (Eurostat, 2025).

Total fertility rate			
Territory	2016	2024	Change
A Coruña	1.17	1	-14.53%
Agrigento	1.26	1.31	3.97%
Beiras e Serra da Estrela	1.19	1.37	15.13%
Bolzano-Bolzen	1.76	1.56	-11.36%
Cádiz	1.41	1.15	-18.44%
Castilla y León (NUTS 2)	1.18	1.06	-10.17%
Ferrara	1.21	1.16	-4.13%
Forlì-Cesena	1.39	1.26	-9.35%
Gorenjska	1.68	1.61	-4.17%
Huelva	1.34	1.15	-14.18%
Lakonia, Messinia	1.32	1.34	1.52%
L'Aquila	1.27	1.12	-11.81%
Málaga	1.34	1.08	-19.40%
País Vasco (NUTS 2)	1.37	1.14	-16.79%

Total fertility rate			
Territory	2016	2024	Change
Pohjois-Savo	1.54	1.21	-21.43%
Pontevedra	1.11	0.96	-13.51%
Potenza	1.14	1.08	-5.26%
Ravenna	1.38	1.2	-13.04%
Madeira	1.15	1.22	6.09%
Rimini	1.33	1.11	-16.54%
Sevilla	1.43	1.23	-13.99%
Torino	1.33	1.14	-14.29%
Trapani	1.33	1.35	1.50%
Trento	1.51	1.28	-15.23%
Vlorë	1.22	0.88 (2023)	-27.87%
Vrancea	1.99	1.55	-22.11%
Warszawski zachodni	1.58	1.32	-16.46%

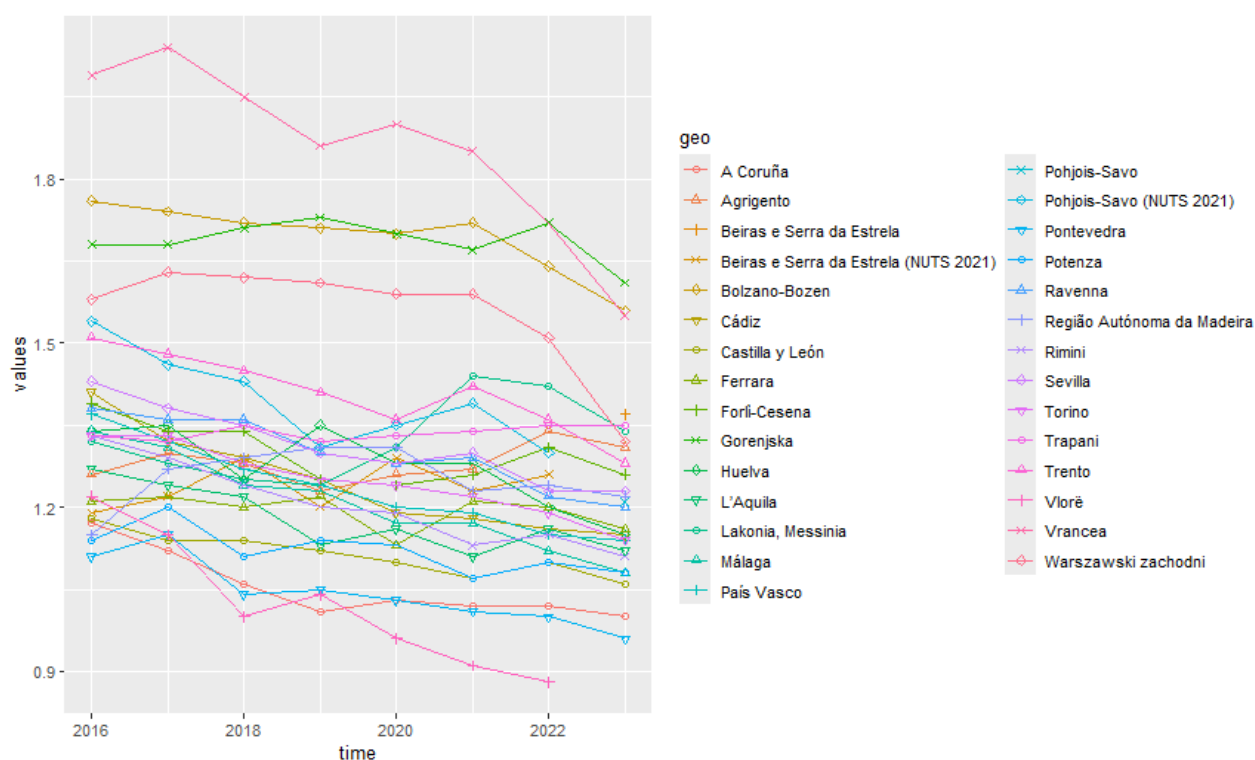


Figure 2. Total Fertility rate in selected NUTS 3 and 2 regions (Source: Eurostat, 2025).

The proportion of the population aged 0-19 years is also in decline in most territories (92.59%). Gains have only happened in Warszawski zachodni, mostly due to the effect of the growing metropolitan area of Warsaw—one of the fastest growing in Europe. Gorenjska displays stability in the proportion. Ferrara and Beiras e Serra da Estrela have a proportion below 15%, whereas five regions have a proportion above 20%.

Table 3. Proportion of population aged 0-19 years (Eurostat, 2025).

Proportion of population aged 0-19 years				Proportion of population aged 0-19 years			
Territory	2016	2024	Change	Territory	2016	2024	Change
A Coruña	16.00%	15.70%	-1.88%	Pohjois-Savo	20.60%	19.10%	-7.28%
Agrigento	19.70%	17.80%	-9.64%	Pontevedra	17.40%	16.30%	-6.32%
Beiras e Serra da Estrela	15.20%	13.80%	-9.21%	Potenza	17.10%	15.50%	-9.36%
Bolzano-Bolzen	21.60%	20.60%	-4.63%	Ravenna	17.10%	16.40%	-4.09%
Cadiz	21.90%	19.90%	-9.13%	Madeira	20.70%	17.60%	-14.98%
Castilla y León (NUTS 2)	16.20%	15.70%	-3.09%	Rimini	18.30%	16.80%	-8.20%
Ferrara	14.80%	14.50%	-2.03%	Sevilla	22.30%	20.70%	-7.17%
Forlì-Cesena	17.80%	16.90%	-5.06%	Torino	17.30%	16.20%	-6.36%
Gorenjska	20.60%	20.60%	0.00%	Trapani	19.00%	17.40%	-8.42%
Huelva	21.20%	19.60%	-7.55%	Trento	20.00%	18.40%	-8.00%
Lakonia, Messinia	18.00%	16.60%	-7.78%	Vlorë	24.90%	19.60% (2023)	-21.29%
L'Aquila	16.40%	15.70%	-4.27%	Vrancea	22.80%	22.20%	-2.63%
Málaga	21.10%	19.70%	-6.64%	Warszawski zachodni	22.30%	23.40%	4.93%
País Vasco (NUTS 2)	18.30%	17.60%	-3.83%				

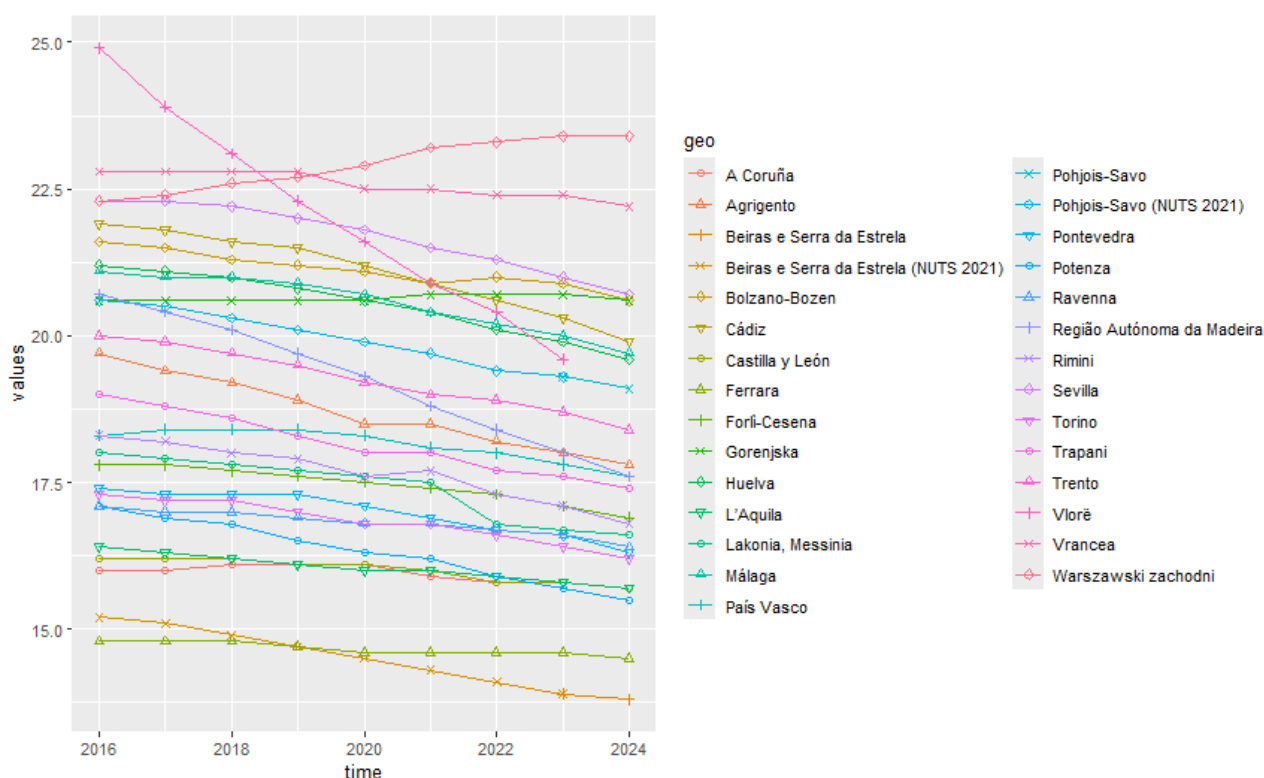


Figure 3. Proportion of population aged 0-19 years (Eurostat, 2025).

The proportion of people aged 65 or older is increasing in all territories, with Beiras and Serra da Estrela above a proportion of 30% and six territories with a proportion lower than 20%.

Table 4. Proportion of population aged 65 years or more (Eurostat, 2025).

Proportion of population aged 65 years or more				Proportion of population aged 65 years or more			
Territory	2016	2024	Change	Territory	2016	2024	Change
A Coruña	23.70%	26.00%	9.70%	País Vasco (NUTS 2)	21.60%	23.80%	10.19%
Agrigento	21.10%	24.00%	13.74%	Pohjois-Savo	22.60%	27.10%	19.91%
Beiras e Serra da Estrela	29.10%	33.60%	15.46%	Pontevedra	21.30%	24.30%	14.08%
Bolzano-Bolzen	19.20%	20.60%	7.29%	Potenza	22.20%	25.70%	15.77%
Cádiz	15.30%	18.60%	21.57%	Ravenna	25.10%	26.00%	3.59%
Castilla y León (NUTS 2)	24.30%	26.90%	10.70%	Rimini	22.30%	24.40%	9.42%
Ferrara	27.40%	28.90%	5.47%	Sevilla	15.60%	18.00%	15.38%
Forlì-Cesena	23.80%	25.20%	5.88%	Torino	24.60%	26.40%	7.32%
Gorenjska	18.60%	21.70%	16.67%	Trapani	22.00%	24.70%	12.27%
Huelva	15.90%	18.10%	13.84%	Trento	21.10%	23.60%	11.85%
Lakonia, Messinia	24.70%	27.50%	11.34%	Vlorë	12.90%	17.20% (2023)	33.33%
L'Aquila	23.10%	26.40%	14.29%	Vrancea	19.40%	20.70%	6.70%
Madeira	16.60%	20.90%	25.90%	Warszawski zachodni	14.60%	17.30%	18.49%
Málaga	16.70%	18.60%	11.38%				

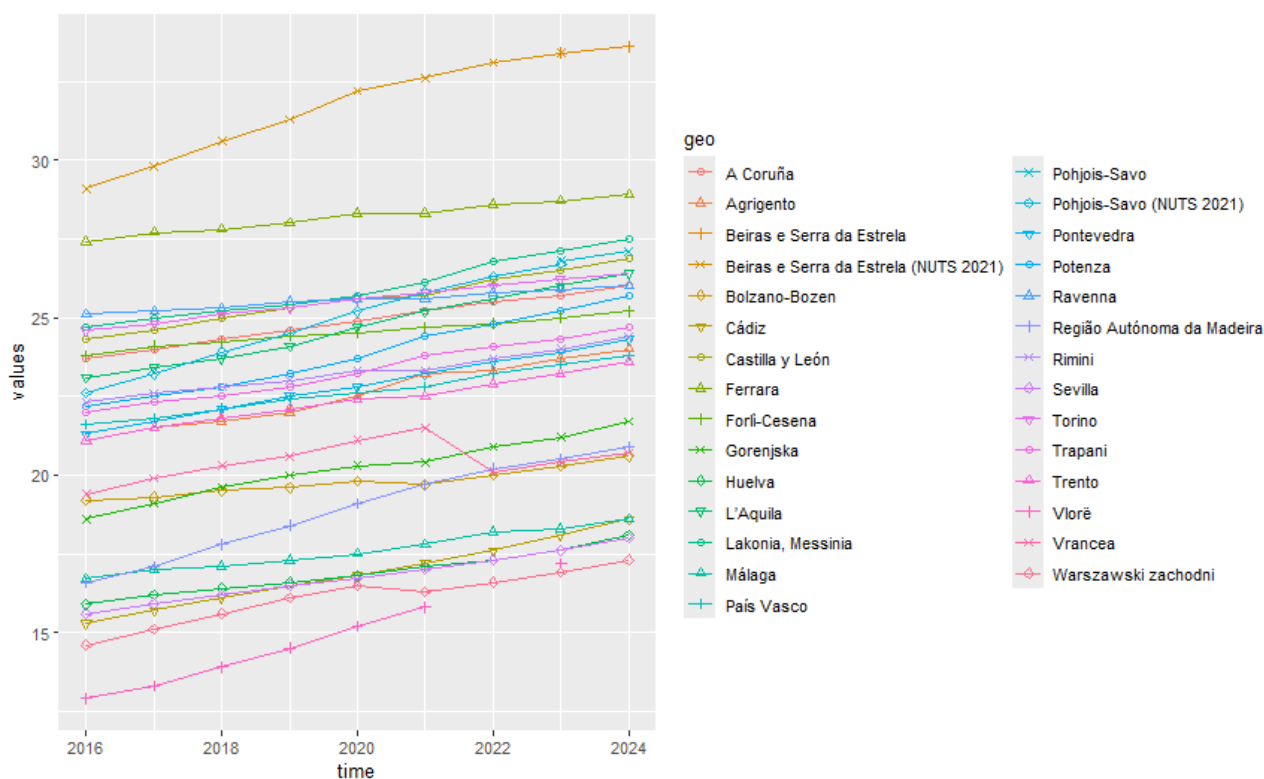


Figure 4. Proportion of population aged 65 years or more (Eurostat, 2025).

All the previous demographic trends we described are also reflected in the fact that the median age of the population of all territories is increasing. Warszawski zachodni and Vlorë have the two lowest median ages, whereas eight territories have a median age of 50 or older.

Table 5. Median age of population (Eurostat, 2025).

Median age of population			
Territory	2016	2024	Change
A Coruña	46.40	49.40	6.47%
Agrigento	43.90	47.70	8.66%
Beiras e Serra da Estrela	51.20	54.10	5.66%
Bolzano-Bolzen	43.10	45.20	4.87%
Cadiz	40.80	44.90	10.05%
Castilla y León (NUTS 2)	47.40	50.40	6.33%
Ferrara	49.90	52.30	4.81%
Forlì-Cesena	46.60	49.30	5.79%
Gorenjska	42.60	44.70	4.93%
Huelva	40.70	44.30	8.85%
Lakonia, Messinia	46.70	50.00	7.07%
L'Aquila	46.60	50.00	7.30%
Madeira	42.40	46.80	10.38%
Málaga	41.50	44.40	6.99%

Median age of population			
Territory	2016	2024	Change
País Vasco (NUTS 2)	45.50	48.00	5.49%
Pohjois-Savo	45.90	46.70	1.74%
Pontevedra	44.60	48.40	8.52%
Potenza	46.00	50.10	8.91%
Ravenna	47.70	50.20	5.24%
Rimini	45.90	49.10	6.97%
Sevilla	40.50	44.10	8.89%
Torino	47.20	50.00	5.93%
Trapani	44.60	48.20	8.07%
Trento	45.00	47.70	6.00%
Vlorë	36.70	41.40 (2023)	12.81%
Vrancea	42.60	44.20	3.76%
Warszawski zachodni	39.30	41.50	5.60%

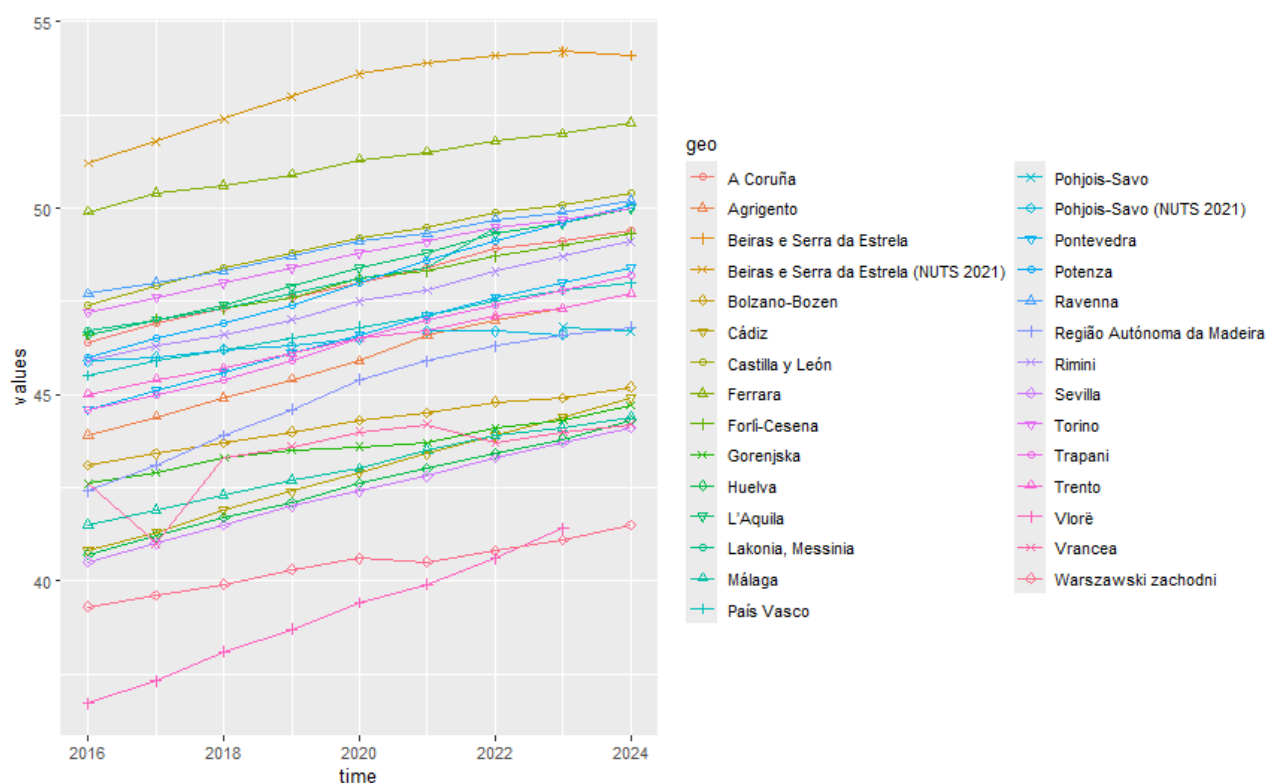


Figure 5. Median age of population (Eurostat, 2025).

Positive net migration is on the rise in most territories (92.56%). In 2016, a high proportion of territories had a negative net migration rate. However, the general tendency in most territories has been an increase in immigration. As such, in 2023, most territories presented a positive net migration. Only Gorenjska, Potenza, Agrigento and Vlore (2023) remain with a negative rate of net migration.

Table 6. Crude rate of net migration plus statistical adjustment (Eurostat, 2025).

Crude rate of net migration plus statistical adjustment			
Territory	2016	2023	Change
A Coruña	1.40%	10.30%	8.90%
Agrigento	-6.90%	-0.80%	6.10%
Beiras e Serra da Estrela	-3.30%	15.20%	18.50%
Bolzano-Bolzen	3.80%	6.10%	2.30%
Cádiz	-1.80%	5.00%	6.80%
Castilla y León (NUTS 2)	-3.00%	9.90%	12.90%
Ferrara	-0.70%	9.60%	10.30%
Forlì-Cesena	2.00%	8.00%	6.00%
Gorenjska	-1.80%	-2.40%	-0.60%
Huelva	-2.30%	5.00%	7.30%
Lakonia, Messinia	3.10%	4.70%	1.60%
L'Aquila	-0.80%	3.70%	4.50%
Madeira	-5.70%	14.10%	19.80%
Málaga	2.00%	13.70%	11.70%

Crude rate of net migration plus statistical adjustment			
Territory	2016	2023	Change
País Vasco (NUTS 2)	3.90%	9.10%	5.20%
Pohjois-Savo	1.50%	8.10%	6.60%
Pontevedra	0.80%	6.50%	5.70%
Potenza	-2.20%	-2.20%	0.00%
Ravenna	4.20%	8.80%	4.60%
Rimini	5.70%	7.20%	1.50%
Sevilla	-1.30%	5.70%	7.00%
Torino	0.80%	6.50%	5.70%
Trapani	-1.90%	0.40%	2.30%
Trento	2.00%	6.50%	4.50%
Vlorë	3.50%	-4.60% (2023)	-8.10%
Vrancea	-4.70%	2.90%	7.60%
Warszawski zachodni	7.70%	12.00%	4.30%

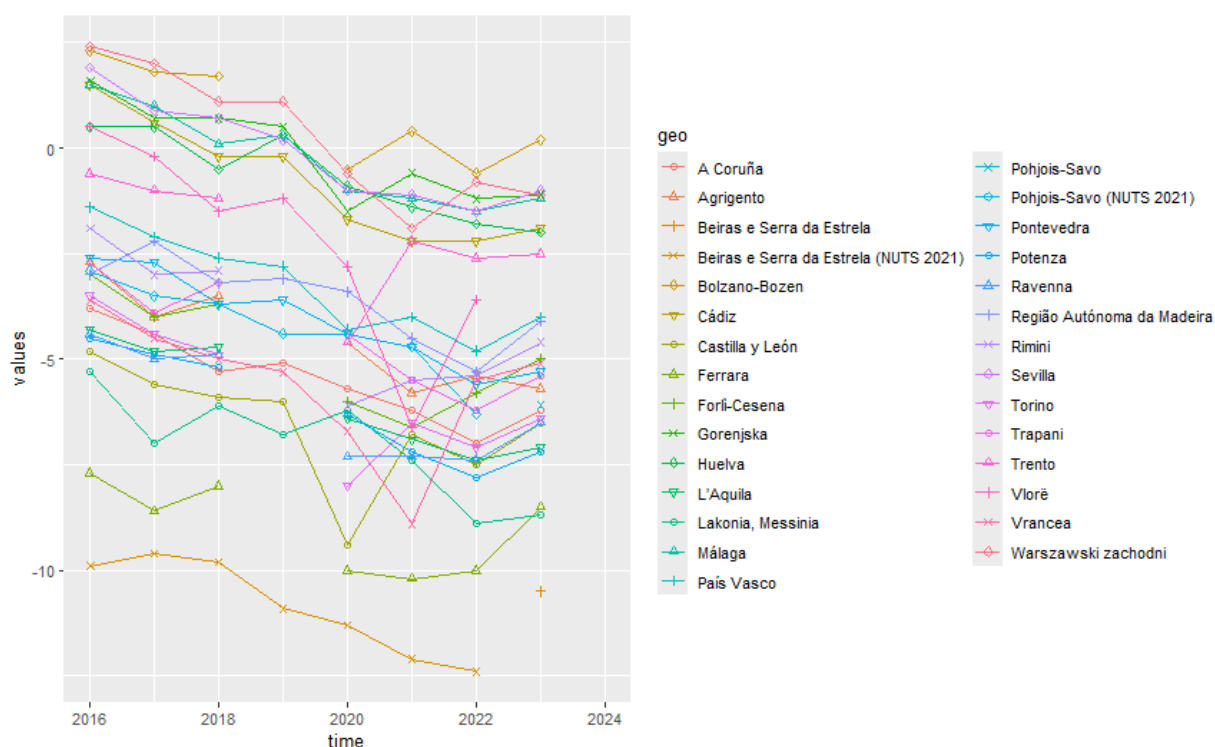


Figure 6. Crude rate of net migration plus statistical adjustment (Eurostat, 2025).

3.2 Relevant economic-demographic trends

We provide a further analysis of the 15-64 age group. In the context of falling birth rates, rising life expectancy, and immigration trends across Europe, this cohort is an essential demographic indicator. It represents the working-age population capable of supporting dependent groups, namely the young and the elderly, from a broad demographic perspective. The general trend, even in the European Union as a whole, is one of decline. The more significant increases happened in territories in dynamic metropolitan areas: Málaga (8.65%) and, especially, Warszawski zachodni (11%), which is at the outskirts of Warsaw. Andalusian territories (the already mentioned Málaga and Sevilla, Huelva, Cadiz) also display an increase in the population of this cohort, demonstrating the economic and demographic dynamism that the Mediterranean arch of Spain has experienced over the last decades. On the contrary, territories outside the central and dynamic economic centres of EU countries show a decline in this key cohort. Declines of more than 10% occurred in Lakonia-Messina, Beiras e Serra da Estrela, and Potenza, while declines of more than 5% occurred in Agrigento, L'Aquila and Trapani.

Table 7. Population from 15 to 64 years and Employed persons in thousands (Eurostat, 2025).

Territory	Population from 15 to 64 years			Employed persons in thousands		
	2016	2024	Change	2016	2022	Change
A Coruña	720 628	708 363	-1.70%	448.30	470.00	4.84%
Agrigento	286 233	260 731	-8.91%	126.10	121.00	-4.04%
Beiras e Serra da Estrela	133 787	119 038	-11.02%	Not available until 2021	86.34	--
Bolzano-Bozen	337 305	345 506	2.43%	287.70	309.10	7.44%
Cádiz	846 805	850 317	0.41%	374.00	409.40	9.47%
Castilla y León (NUTS 2)	1 558 651	1 484 280	-4.77%	955.50	1003.40	5.01%
Ferrara	215 329	206 616	-4.05%	132.80	132.40	-0.30%
Forlì-Cesena	246 643	246 344	-0.12%	180.90	188.90	4.42%
Gorenjska	133 702	131 694	-1.50%	81.35	92.29	13.45%
Huelva	353 088	364 558	3.25%	172.80	186.00	7.64%
L'Aquila	195 929	178 675	-8.81%	115.20	114.90	-0.26%
Lakonia, Messina	155 252	137 929	-11.16%	103.42	111.27	7.59%
Málaga	1 100 390	1 195 588	8.65%	575.30	673.40	17.05%
País Vasco (NUTS 2)	1 398 361	1 419 078	1.48%	989.30	1030.80	4.19%
Pohjois-Savo	154 353	146 746	-4.93%	103.56	112.77	8.89%
Pontevedra	619 587	608 812	-1.74%	360.80	387.10	7.29%
Potenza	243 092	217 873	-10.37%	135.30	133.30	-1.48%
Ravenna	241 411	241 522	0.05%	171.20	175.50	2.51%
Madeira	174 482	171 690	-1.60%	117.56	126.56	7.66%
Rimini	212 731	216 539	1.79%	150.30	160.60	6.85%
Sevilla	1 302 023	1327 932	1.99%	680.20	756.60	11.23%
Torino	1 415 447	1 369 628	-3.24%	988.20	992.50	0.44%
Trapani	278 512	260 399	-6.50%	127.60	128.70	0.86%
Trento	345 242	344 626	-1.78%	257.5	271.1	5.28%
Vlorë	131 170	127 138 (2023)	-3.07%	--	--	--
Vrancea	211 400	209 982	-0.67%	105.21	109.79	4.35%
Warszawski zachodni	421 813	468 233	11.00%	234.40	290.40	23.89%
EU (27 countries)	290 339 160	286 491 649	-1.33%	201 062.30	215 052.70	6.96%

On the other hand, a positive note is that the number of employed persons is increasing in most territories (84%). The growth was especially significant in Warszawski zachodni (23.89%), Málaga and Gorenjska. The exceptions are Agrigento and Potenza, as well as Ferrara and L'Aquila, which show slight declines. Furthermore, all the territories that experienced a reduction or stagnation in the workforce during the period 2016-2022 are Italian. However, several Italian regions have experienced clear increases, such as Bolzano-Bolzen, Rimini and Trento. Note that the most recent figure for employed persons is from 2022, which may still reflect the negative impact of the economic and labour market effects of the COVID-19 crisis. Employment growth may serve as a baseline to slow demographic decline or at least achieve a lower population with a more stable population structure.

3.3 Relevant economic trends

Following the general European pattern, the gross domestic product (GDP) has grown in all territories during the period 2016-2022, with moderate growth in most of them (Table 8 and Figure 7). All of this in the context of the economic crisis of COVID-19 and the subsequent recovery years. The highest GDP growth happened in Vrancea, Huelva, Madeira, Gorenjska, and Vlore, whereas the most moderate GDP growth happened in Ferrara, Ravenna and Torino. The richest territories are Bolzano-Bolzen, Trento, and Pohjois-Savo, whereas the poorer are Vlore, Vrancea, and Laconia-Messina.

Economic convergence has been one of the primary goals of the EU. In Table 9 and Figure 8, we see the GDP per inhabitant as a percentage of the EU27 average, which helps us visualise whether the analysed territories are converging to the EU27 average (100). It provides a rawer picture of convergence without considering price differences among territories. In that sense, in Table 10 and Figure 9, we see the Purchasing Power Standard (PPS) per inhabitant as a percentage of the EU27 (from 2020) average. This indicator is widely employed to measure economic convergence among EU regions and forms the basis of our analysis. Although Albania is not part of the EU, we consider it relevant for the analysis because the EU-Albania agreements include economic support to achieve a certain level of economic convergence.

We consider that only seven territories are converging (26.92%). In this group, we include five territories with a lower income than the EU average that have reduced the gap at least by 5 points (Huelva, Madeira, Vrancea, Gorenjska, and Pohjois-Savo). We also include territories with an income above the EU average that are reducing their advantage gradually (Trento and Forlì-Cesena). We consider the rest not to be converging. First, there are ten territories with a lower income than the EU average that are worse in 2022 than in 2016. Two low-income territories remain at the same level. Agrigento, with a PPS of 52% has improved by merely 1 point. On the other hand, Torino, País Vasco and Ravenna, although they are above the EU average, have dropped more than 7 points. In addition, Rimini (-4) and especially Warszawski zachodni (-8) have dropped to the category of territories below the EU average. Finally, the richest territory, Bolzano-Bolzen, increased its advantage by +7 points.

Overall, this shows that the territories are not converging economically with the rest of Europe, following the general European pattern. Most territories that depart from a lower GDP are not converging; the "middle upper class" of territories, which were around or above the EU average, is losing its position; and the richest territories are able to maintain their advantage.

Table 8. Gross domestic product at current market prices, Euro per inhabitant (Eurostat, 2025).

GDP at current market prices, Euro per inhabitant			
Territory	2016	2022	Change
A Coruña	22 700	27 600	21.59%
Agrigento	14 700	18 000	22.45%
Beiras e Serra da Estrela		15 900	
Bolzano-Bolzen	44 300	56 000	26.41%
Cádiz	16 800	20 300	20.83%
Castilla y León (NUTS 2)	22 400	27 400	22.32%
Ferrara	26 300	28 900	9.89%
Forlì-Cesena	31 500	37 100	17.78%
Gorenjska	17 100	23 600	38.01%
Huelva	17 900	25 500	42.46%
Lakonia, Messinia	12 400	14 600	17.74%
L'Aquila	24 300	29 100	19.75%
Málaga	17 400	21 400	22.99%
País Vasco (NUTS 2)	30 800	36 400	18.18%

GDP at current market prices, Euro per inhabitant			
Territory	2016	2022	Change
Pohjois-Savo	32 100	42 200	31.46%
Pontevedra	20 500	25 200	22.93%
Potenza	23 600	27 200	15.25%
Ravenna	31 700	35 800	12.93%
Madeira	17 500	24 700	41.14%
Rimini	29 300	33 900	15.70%
Sevilla	18 900	23 000	21.69%
Torino	31 400	35 600	13.38%
Trapani	15 900	18 800	18.24%
Trento	36 400	43 900	20.60%
Vlorë	3 400	4 600 (2021)	35.29%
Vrancea	5 100	8 000	56.86%
Warszawski zachodni	16 100	20 600	27.95%
EU27 (from 2020)	28 300	36 000	27.21%

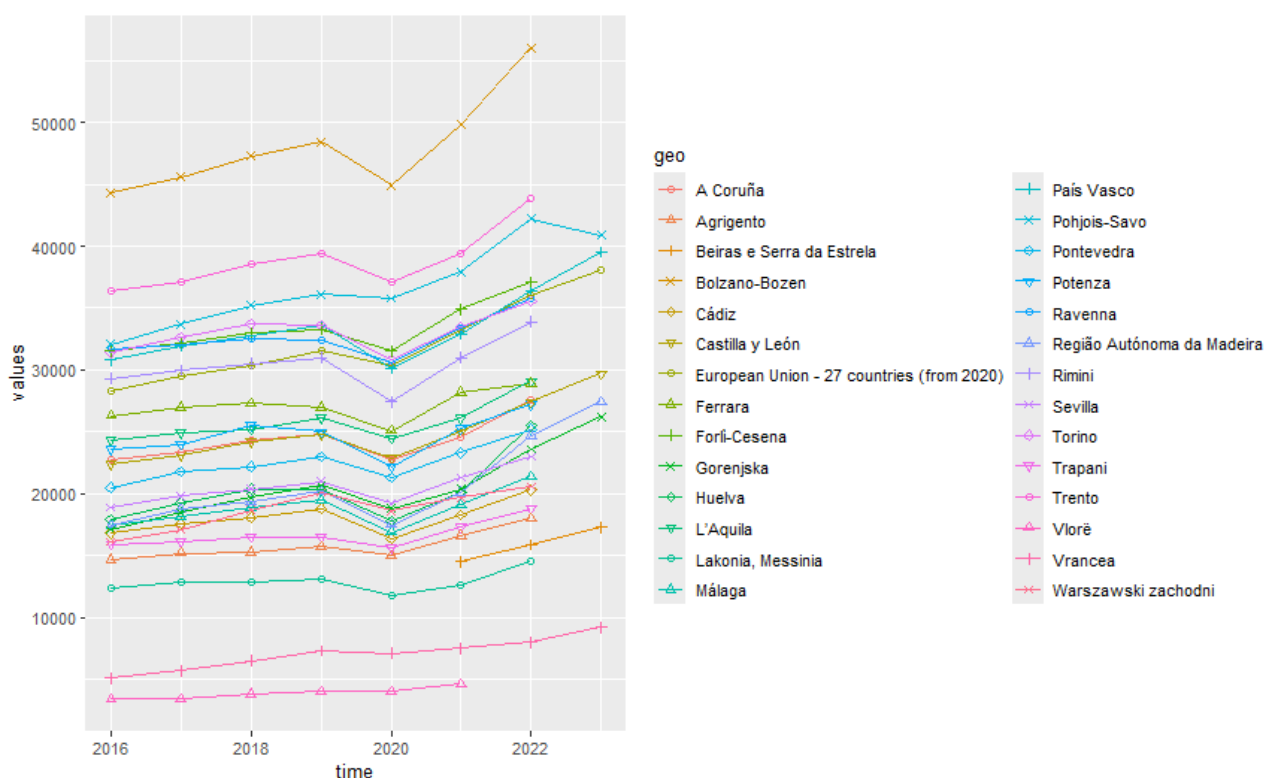


Figure 7. Gross domestic product at current market prices, Euro per inhabitant (Eurostat, 2025).

Table 9. Gross domestic product at current market price, Euro per inhabitant in percentage of the EU27 average (Eurostat, 2025).

GDP at current market prices, Euro per inhabitant in percentage of EU27 average			
Territory	2016	2022	Change
A Coruña	80	77	-3.75%
Agrigento	52	50	-3.85%
Beiras e Serra da Estrela		44	
Bolzano-Bolzen	156	156	0.00%
Cádiz	59	56	-5.08%
Castilla y León (NUTS 2)	79	76	-3.80%
Ferrara	93	80	-13.98%
Forlì-Cesena	111	103	-7.21%
Gorenjska	60	66	10.00%
Huelva	63	71	12.70%
Lakonia, Messinia	44	41	-6.82%
L'Aquila	86	81	-5.81%
Málaga	61	60	-1.64%
País Vasco (NUTS 2)	109	101	-7.34%

GDP at current market prices, Euro per inhabitant in percentage of EU27 average			
Territory	2016	2022	Change
Pohjois-Savo	113	117	3.54%
Pontevedra	72	70	-2.78%
Potenza	83	76	-8.43%
Ravenna	112	100	-10.71%
Madeira	62	69	11.29%
Rimini	103	94	-8.74%
Sevilla	67	64	-4.48%
Torino	111	99	-10.81%
Trapani	56	52	-7.14%
Trento	129	122	-5.43%
Vlorë	12	14 (2021)	16.67%
Vrancea	18	22	22.22%
Warszawski zachodni	57	57	0.00%

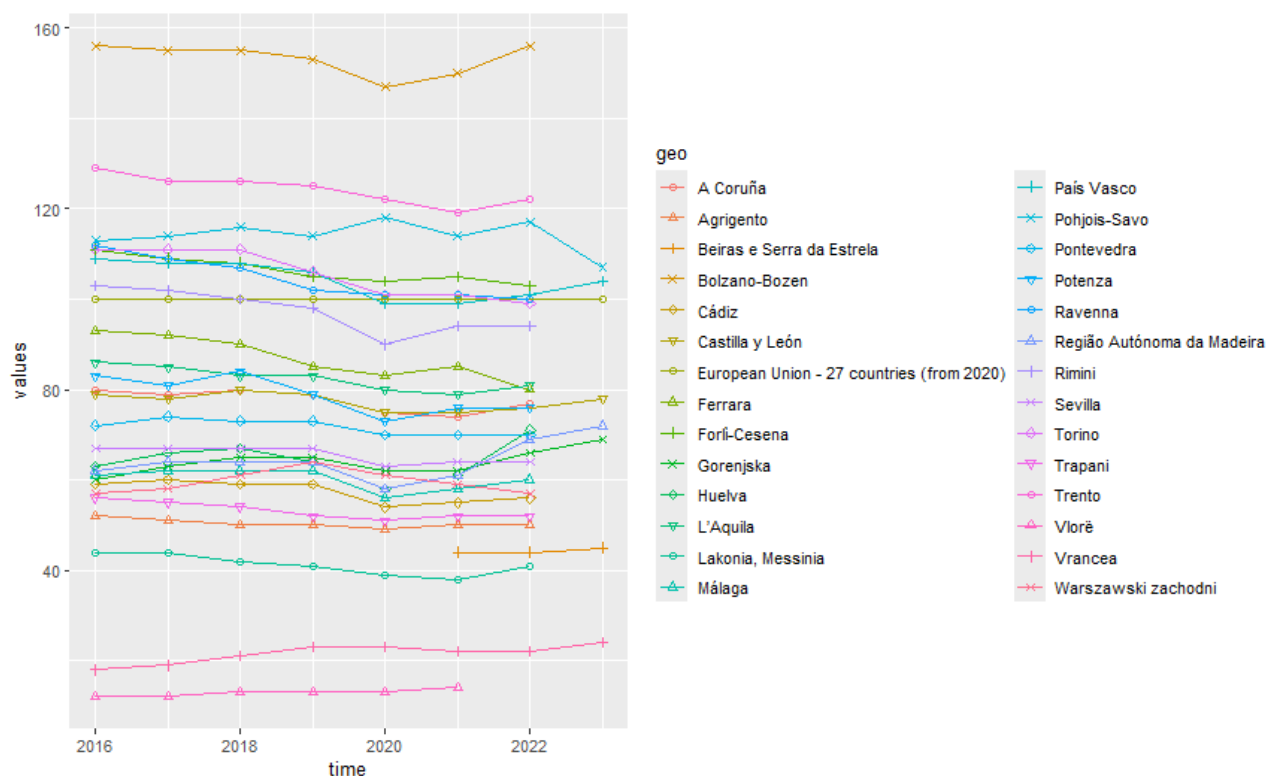


Figure 8. Gross domestic product at current market price, Euro per inhabitant in percentage of the EU27 average (Eurostat, 2025).

Table 10. Purchasing power standard (PPS), per inhabitant in percentage of the EU27 (from 2020) average (Eurostat, 2025).

PPS, per inhabitant in percentage of the EU27 average			
Territory	2016	2022	Change
A Coruña	87	84	-3.45%
Agrigento	51	52	1.96%
Beiras e Serra da Estrela		53	
Bolzano-Bolzen	155	162	4.52%
Cádiz	64	62	-3.13%
Castilla y León (NUTS 2)	85	84	-1.18%
Ferrara	92	84	-8.70%
Forlì-Cesena	110	107	-2.73%
Gorenjska	73	78	6.85%
Huelva	68	78	14.71%
Lakonia, Messinia	52	50	-3.85%
L'Aquila	85	84	-1.18%
Málaga	66	66	0.00%
País Vasco (NUTS 2)	118	111	-5.93%

PPS, per inhabitant in percentage of the EU27 average			
Territory	2016	2022	Change
Pohjois-Savo	89	94	5.62%
Pontevedra	78	77	-1.28%
Potenza	83	79	-4.82%
Ravenna	111	104	-6.31%
Madeira	75	82	9.33%
Rimini	102	98	-3.92%
Sevilla	72	70	-2.78%
Torino	110	103	-6.36%
Trapani	56	54	-3.57%
Trento	128	127	-0.78%
Vlorë	27	27 (2021)	0.00%
Vrancea	35	40	14.29%
Warszawski zachodni	100	92	-8.00%

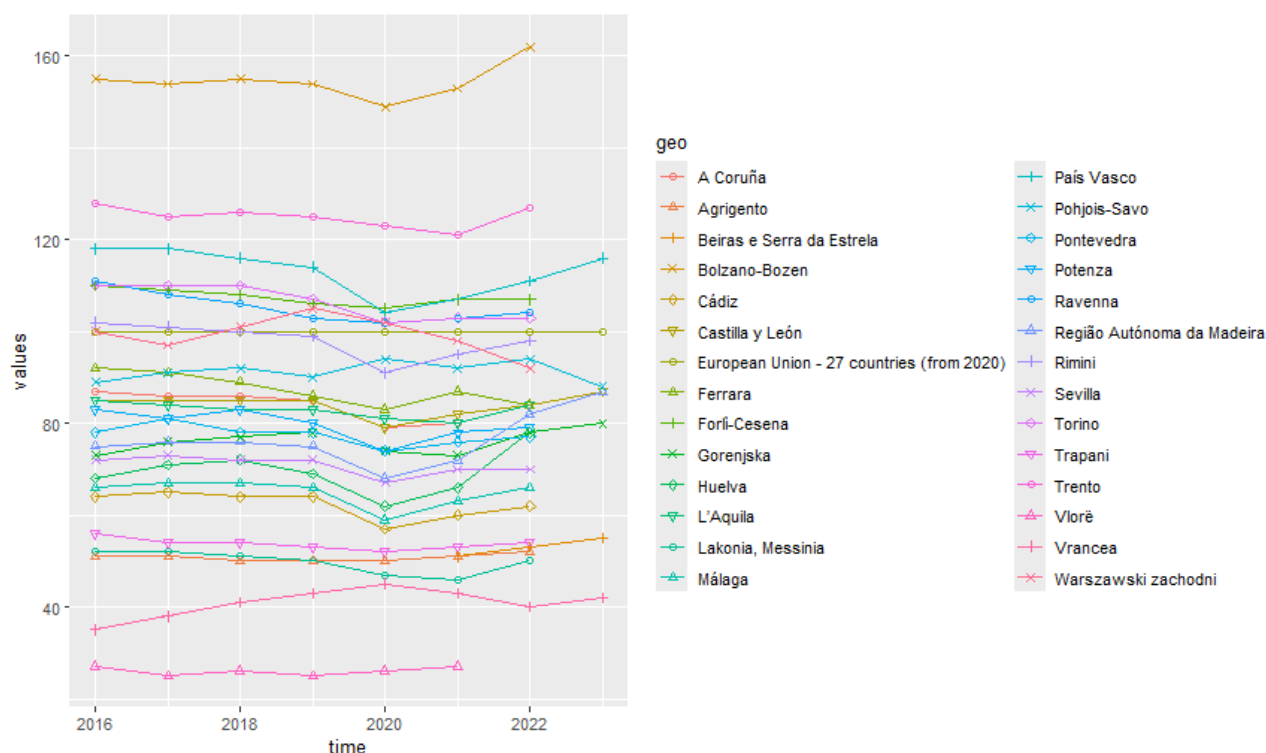


Figure 9. Purchasing power standard (PPS), per inhabitant in percentage of the EU27 (from 2020) average (Eurostat, 2025).

3.3.1 Agriculture, forestry and fishery socioeconomic trends

Regarding the number of employed persons in agriculture, forestry and fishery, there is no general pattern. There is a clear pattern regarding the value added, though: nearly three-quarters of the territories (73.08%) have increased the value added of agriculture, forestry and fishery in the period 2016-2022. The most notorious decline happened in northern Spain: A Coruña and País Vasco had notable declines (more than 15%) in the value added of the primary sector, especially Pontevedra (-29.48%), in conjunction with a stagnant primary sector workforce in A Coruña and a decline in País Vasco and Pontevedra. Ferrara also experienced a significant drop in the added value of the primary sector (-14.79%), despite increasing the primary sector workforce by 27.27%. Sevilla, Rimini and Torino had slight decreases in the added value. Note that the most recent figure for this economy is 2022, which may still reflect the negative impact on the economy and labour market due to the COVID-19 crisis. Agrigento is interesting: as seen in Table 1, it had a reduction in its total workforce of 4.04% in the period 2016-2022. However, as seen in Table 11, the workforce in the primary sectors increased by 10.07%, and its gross value added increased a staggering 61.90%. Another interesting case is Ferrara, which added employment (+27.27%); however, the value added dropped (-14.79%). A similar case, with lighter value drops, happened in Rimini and Torino.

Table 11. Employed persons in thousands (Eurostat, 2025).

Territory	Employed persons in thousands: Agriculture, forestry and fishing			Gross value added at current prices, million euros: Agriculture, forestry and fishing		
	2016	2022	Change	2016	2022	Change
A Coruña	22.90	22.70	-0.87%	1 031.00	837.90	-18.73%
Agrigento	14.90	16.40	10.07%	370.60	600.00	61.90%
Beiras e Serra da Estrela	--	11.50		--	129.07	--
Bolzano-Bozen	18.50	20.60	11.35%	1 013.90	1 204.00	18.75%
Cádiz	8.70	12.90	48.28%	642.30	831.10	29.39%
Castilla y León (NUTS 2)	69.70	72.10	3.44%	2 727.60	3 175.00	16.40%
Ferrara	7.70	9.80	27.27%	474.10	404.00	-14.79%
Forlì-Cesena	8.90	13.00	46.07%	523.20	543.00	3.78%
Gorenjska	4.90	4.59	-6.33%	56.88	81.47	43.23%
Huelva	33.90	32.70	-3.54%	672.60	829.90	23.39%
L'Aquila	5.80	5.40	-6.90%	246.90	286.00	15.84%
Lakonia, Messinia	34.51	35.33	2.38%	394.35	451.26	14.43%
Málaga	17.90	19.80	10.61%	734.60	942.00	28.23%
País Vasco (NUTS 2)	12.10	11.30	-6.61%	509.90	424.10	-16.83%
Pohjois-Savo	7.72	7.47	-3.24%	391.01	557.30	42.53%
Pontevedra	24.20	21.50	-11.16%	938.00	661.50	-29.48%
Potenza	12.00	10.50	-12.50%	272.30	373.00	36.98%
Ravenna	7.30	10.20	39.73%	557.70	588.00	5.43%
Madeira	17.08	13.28	-22.25%	75.32	84.15	11.72%
Rimini	2.60	3.00	15.38%	108.10	105.00	-2.87%
Sevilla	36.40	33.10	-9.07%	1 891.30	1 830.90	-3.19%
Torino	9.90	10.10	2.02%	416.60	395.00	-5.18%
Trapani	12.10	13.60	12.40%	334.30	412.00	23.24%
Trento	11.00	12.8	16.36%	679.40	884.00	30.11%
Vlorë	--	--		136.86	204.61	49.50%
Vrancea	28.42	31.53	10.94%	146.13	204.57	39.99%
Warszawski zachodni	12.60	11.10	-11.90%	168.23	298.12	77.21%
EU (27 countries)	10 016.15	9 160.60	-8.54%	197 698.70	270 451.1	36.80%

3.3.2 Other sectors: Tourism

In the context of the post-COVID recovery in pernoctations, the nights spent at tourist accommodation establishments are still growing moderately in most territories (85.18%), apart from Vrancea, Agrigento, A Coruña and Pohjois-Savo (Figure 10). However, the overall picture of the sector also requires assessing guest nights spent at short-stay accommodation offered via collaborative economy platforms (Table 12), which has vigorously grown in all territories, following the general trend in the EU. This illustrates the potential of the tourism industry. A potential consideration should be the environmental and social problems of the current tourism industry, such as massification and the impact of short-stay accommodations on rent prices and real estate in many locations.

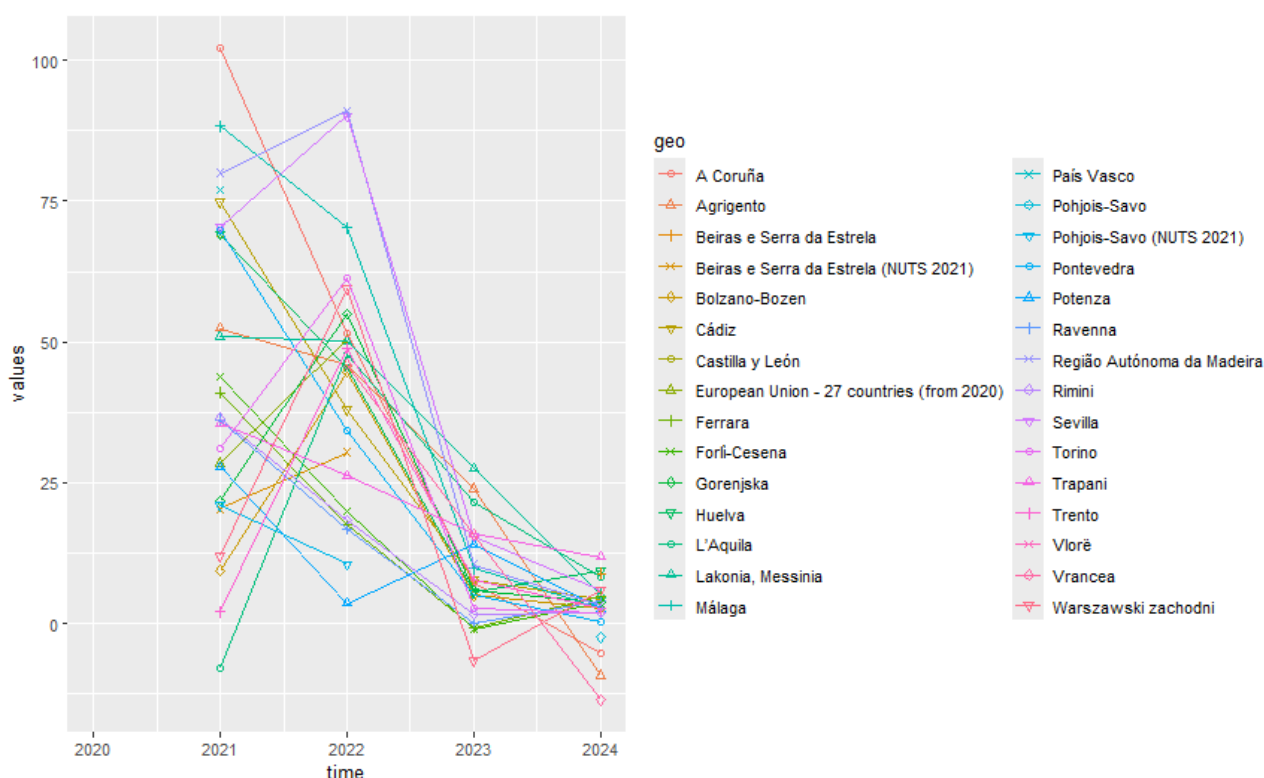


Figure 10. Nights spent at tourist accommodation establishments (Eurostat, 2025).

Table 12. Guest nights spent at short-stay accommodation offered via collaborative economy platforms (Eurostat, 2025).

Territory	Guest nights		
	2018	2024	Change
A Coruña	757 208	2 095 154	176.69%
Agrigento	315 183	517 268	64.12%
Beiras e Serra da Estrela	73 824	257 648	249.00%
Bolzano-Bozen	960 354	2 353 209	145.04%
Cádiz	2 654 743	5 412 854	103.89%
Castilla y León (NUTS 2)	--	--	--
Ferrara	139 825	212 419	51.92%
Forlì-Cesena	57 030	130 289	128.46%
Gorenjska	682 506	1 222 835	79.17%
Huelva	537 999	1 042 633	93.80%
L'Aquila	104 037	300 745	189.08%
Lakonia, Messinia	449 956	1 063 386	136.33%
Málaga	10 202 172	22 515 737	120.70%
Pais Vasco (NUTS 2)	--	--	--
Pohjois-Savo	71 111	184 848	159.94%
Pontevedra	684 711	2 408 964	251.82%
Potenza	30 733	63 269	105.87%
Ravenna	176 739	265 841	50.41%
Madeira	1 227 548	4 082 170	232.55%
Rimini	242 836	572 531	135.77%
Sevilla	3 242 428	6 657 111	105.31%
Torino	1 015 638	2 258 569	122.38%
Trapani	1 074 847	1 806 405	68.06%
Vlorë	--	--	--

Territory	Guest nights		
	2018	2024	Change
Vrancea	777	9 774	1 157.92%
Warszawski zachodni	21 375	103 099	382.33%

Territory	Guest nights		
	2018	2024	Change
EU (27 countries)	441 914 699	854 082 808	93.27%

3.4 Energy

Cooling degree days are a weather-based index to estimate the energy requirements for cooling buildings. Heating degree days are the equivalent index to estimate the energy requirements for heating buildings. They are correlated with high and low temperatures, respectively. In the EU, the heating degree days values decreased by 19% between 1979 and 2022, whereas the cooling degree days values increased by almost four times (Eurostat, 2024).

Although this type of trend is better assessed using more extended periods, the annual data of recent years confirm the general European trend indicated above. Based on the 8-year trend line of each territory from 2016 to 2024, cooling degree days decreased in all territories at a light but consistent pace. On the contrary, heating degree days are increasing in the EU and most territories; however, the pattern is more volatile. Territories such as Trapani, Agrigento or Lakonia-Messina have seen a steeper increase in the heating degree days index in recent years. Huelva and Beiras e Sera da Estrela show a slight downward trend from their 2016 values; however, a closer analysis reveals that they achieve their highest values in 2023 and 2022, respectively.

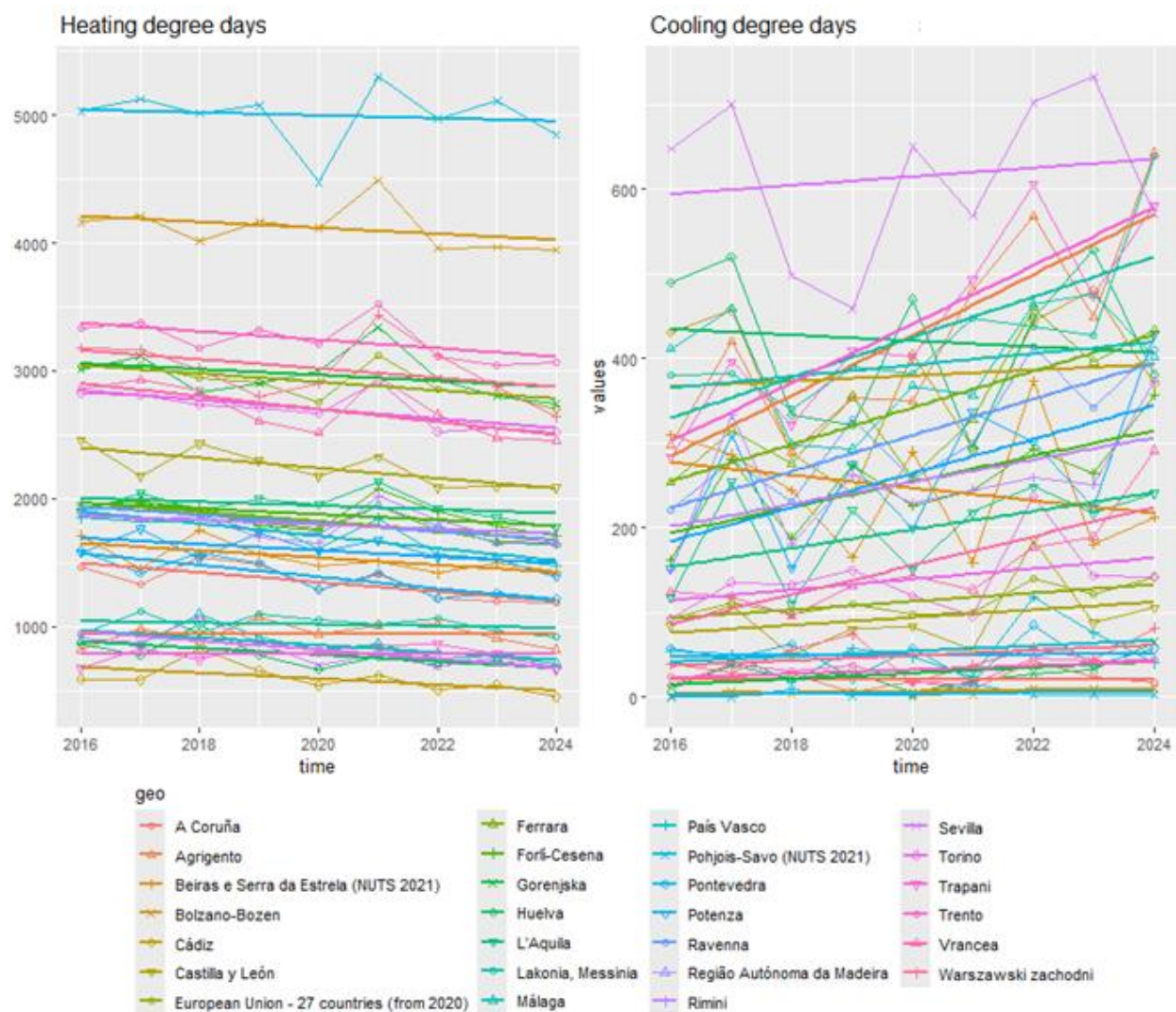


Figure 11. Gross domestic product at current market price, Euro per inhabitant in percentage of the EU27 average (Eurostat, 2025).

4 Synthesis and discussion of the key socioeconomic trends

In this section, we first synthesise the analysis done in the previous section to define seven key socioeconomic trends that are broadly shared across the case studies. In addition, we map those seven socioeconomic trends to the risks identified by the case studies (provided in D2.2 and D2.7 and synthesised in D2.5). Then, we rank the socioeconomic trends based on the number of risks linked to them. Finally, we provide a brief discussion of the socioeconomic trends in the context of the associated climate change risks.

Socioeconomic trend	T1. The growing employed population as a potential demographic baseline
Description	The core working-age population (aged 15-64) is declining in most territories, although this is not as common as other demographic declines. This decline in the working-age population is translating into a smaller demographic base for economic activity in many territories. However, despite this shrinkage, the number of employed people has increased in most of these regions. This suggests a tightening labour market, where factors like increased labour force participation and economic migration are providing a vital counterbalance to demographic decline. This could indicate a demographic baseline, based on a steadily growing employed population that would help stabilise the decline in a baseline population level.
Socioeconomic trend	T2. Growing increased value in the primary sectors
Description	The primary sectors targeted by FARCLIMATE—agriculture, forestry, and fisheries—present a mixed but generally positive picture in terms of economic aggregates. While employment patterns vary, a clear trend emerges in economic output, with most territories experiencing an increase in the gross value added from these sectors. This suggests a shift towards higher-value products, increased productivity, or more efficient practices, even in places where the primary sector workforce is stagnant. The trend highlights the sector's enduring economic importance and its potential for resilient development, though it also carries risks related to market volatility and pressure on natural resources.

Risks related to socioeconomic trends T1 and T2 (see D2.5 for description)

Most risks identified by the case studies relate to challenges of climate change to economic activities or ecosystems. Most of the ecosystem risks also have an impact on economic activities; as such, they are relevant for trends related to economic activity. In that sense, all of these risks are linked to affecting the workforce or the value added of the primary sectors, making these two socioeconomic trends probably the most relevant for the FARCLIMATE case studies.

- Case study 1 – Ría de Pontevedra: Risk M1 Collapse of shellfish harvesting activity; Risk M2 Disruption of traditional fishing due to ecosystem shifts; Risk M4 Reduced operational viability for marine professionals.
- Case study 2 – Ría de Arousa: Risk M5 Collapse of shellfish harvesting activity; Risk M6 Disruption of artisanal fishing due to ecosystem shifts; Risk M7 Decreased marine productivity from environmental degradation.
- Case study 3 – Mediterranean rural Spain: Risk C1 Economic collapse of the Dehesa production model; Risk C2 Ecological degradation of the agrosilvopastoral system.
- Case study 4 – Fundão: Risk F1 Ecosystem collapse and increased wildfire catastrophe; Risk A1 Crop failure and economic loss in high-value agriculture; C3. Degradation of inland aquatic ecosystems.
- Case study 5 – Growing Cities Lab, Torino: Risk A2 Physical collapse of urban garden production; Risk A3 Increasing difficulties in the fulfilment of the social mission of urban gardens.
- Case study 6 – Tarczyn: Risk A4 Crop failure due to pollination and weather disruption; Risk A5 Production loss and environmental damage from extreme water events; Risk A6 Landscape-scale biodiversity collapse.
- Case study 7 – Málaga: Risk F2 Forest degradation and the collapse of bioeconomy initiatives; Risk A7 Agricultural sector declines due to water scarcity.
- Case study 8 – Rebollo in Castilla y León: Risk F3 Ecological decline of Pyrenean oak forests; Risk F4 Economic stagnation and failure to adapt to forest management; Risk F5 Failure of adaptation efforts due to governance gaps.
- Case study 9 – Gorenjska Region: Risk F6 Forest degradation and economic disruption to the forestry sector; Risk F7 Increased flood and landslide damage to communities; Risk F8 Loss of biodiversity and ecosystem services.
- Case study 10 – Vlore: Risk A8 Economic viability collapse in the viticultural sector; Risk A9 Crop destruction and production loss from extreme weather.
- Case study 11 – Sicily: Risk A10 Economic collapse of small-scale viticulture; Risk A11 Increased production instability from pests and extreme weather; Risk A12 Long-term degradation of agricultural
- Case study 13 – Radiata pine in the Basque Country: Risk F9 Forest productivity decline from climate-exacerbated diseases.
- Case study 14 – Kaem: Risk A13 Olive production failure from water scarcity and heat stress.
- Case study 15 – EXO: Risk A14 Socio-economic collapse from compound climate disasters.
- Case study 17 – Alcornocales Natural Park: Risk F10 Ecosystem degradation and economic loss from oak decline.
- Case study 18 – SUSGRASS: Risk A15 Instability in forage production and supply chain disruption.
- Case study 19 – Porto Santo: Risk C5 Infrastructure damage and water insecurity.
- Case study 20 – Vaia Strom: Risk F11 Forest ecosystems collapse from extreme weather and pest outbreaks.
- Case study 21 – Emilia-Romagna Region: Risk M9 Disruption of traditional fisheries by invasive alien species.
- Case study 24 – Abruzzo: Risk F12 Catastrophic wildfires in abandoned pine plantations.

- Case study 25 – Focșani: Risk F13 Decline of protective forests due to climate stress and lack of adaptation.

Discussion of trends T1 and T2 in the context of the associated climate change risks

Europe's demographic ageing is shrinking the working-age population share across most countries and many regions, with projections indicating further tightening of labour supply unless offset by mobility or policy responses (Krupowicz & Kuropka, 2021). Recent evidence shows that net migration has partially counterbalanced negative cohort turnover in many territories, which helps sustain employment and can stabilise local economic activity if effectively integrated (Ghio et al., 2022). However, ageing workforces are associated with slower productivity growth in European economies, which raises the relevance of policies that enhance participation, skills, and technology adoption to maintain output per worker as labour markets tighten (Calvo-Sotomayor et al., 2018).

European primary sectors are evolving toward higher-value products and more efficient practices. Even where employment is stagnant or declining—especially among older workers in agriculture, forestry, and fishing—the shift toward value and productivity can preserve sectoral relevance in regional economies if accompanied by modernisation and skills renewal. Sustaining this trajectory requires attention to the broader productivity observed across European regions, aligning primary-sector investments with innovation, skills, and technological diffusion to raise value added per worker (Capriate et al., 2024).

In the context of the risks identified by the FARCLIMATE case studies, the broad patterns of invasive species add pressure across European ecosystems and thus, workers and businesses must contend with lower natural productivity, so the stabilising effect of a growing employed base hinges on complementary ecological restoration and risk-reduction measures to protect ecosystems (Polce et al., 2023). Indeed, the economic burden of invasive species, pathogens, and pests already runs into tens of billions across Europe. This burden directly undermines the value gains sought in agriculture, forestry, and fisheries, making biosecurity, surveillance, and rapid response indispensable components of sectoral upgrading (Haubrock et al., 2021). Species redistribution and altered productivity complicate the shift to higher-value fisheries by destabilising stock availability and traditional practices. This requires adaptive management, fleet flexibility, and market diversification to secure revenues under changing ecological baselines (Polce et al., 2023).

Socioeconomic trend	T3. Pervasive demographic ageing
Description	Across the territories, a dominant and near-global trend is population ageing. This is consistently driven by a combination of low and declining fertility rates and a shrinking proportion of young people (under 20). Concurrently, the share of the population aged 65 and over is steadily increasing, a reality confirmed by the rising median age across the group of territories. This structural demographic shift points to long-term challenges for social support systems, healthcare, and the future workforce.

Socioeconomic trend	T4. Migration as a demographic counter
Description	Migration has become a significant demographic factor in most territories, often partially compensating for trends of population loss. Although not entirely uniform, this influx of people now represents the primary source of demographic renewal in many territories. Immigration is beginning to reshape local age structures and inject demographic dynamism into the regions receiving new populations. However, while most territories now experience positive net migration, this is generally insufficient to reverse the underlying trend of natural population decline.

Risks related to socioeconomic trends T3 and T4 (see D2.5 for description)

Demographic challenges have also been identified in several case studies, including the potential collapse of rural territories and health crises.

- Case study 2 – Ría de Arousa: Risk M8 Generational crisis and loss of cultural heritage.
- Case study 3 – Mediterranean rural Spain: Risk C1 Economic collapse of the Dehesa production model.
- Case study 7 – Málaga: Risk C4 Public health crisis and tourism disruption from extreme heat.
- Case study 15 – EXO: Risk A14 Socioeconomic collapse from compound climate disasters.

Discussion of trends T3 and T4 in the context of the associated climate change risks

Population ageing is pervasive across the EU, driven by persistently low fertility and rising longevity, with projections indicating continued increases in old-age shares and dependency ratios across most member states and regions by mid-century (Krupowicz & Kuropka, 2021). This shift strains public finances and labour markets due to higher pension, health, and long-term care expenditures, alongside a smaller contributor base. This reinforces the need for active ageing, later retirement, and productivity-enhancing reforms to sustain growth and fiscal sustainability (Filipović, S. & Miljković, 2024).

While net migration influences annual rates of population change, it often does not fully reverse natural deficits at sub-national scales, making outcomes highly sensitive to regional economic structure, internal mobility, and inclusion policies (Newsham & Rowe, 2025). The effectiveness of the demographic baseline we discussed in trends T1 and T2 depends on integration and local context, since migrant employment gaps vary with regional competitiveness and policy design, underscoring the need for place-sensitive labour and inclusion strategies (Cristea et al., 2020; De Coninck & Solano, 2023). Regions need integration policies and local institutional capacity to translate demographic inflows into adaptive human capital for primary sectors, or else risks compound as ageing continues and shocks intensify (De Coninck & Solano, 2023).

Regarding the associated risks, a shrinking population leaves remote territories exposed to service loss and cultural attrition unless targeted place-based policies attract and retain residents (Newsham & Rowe, 2025). An older population amplifies vulnerability to extreme heat, necessitating heat-health action plans, early warnings, urban cooling, and healthcare surge capacity (García-León et al., 2024; Kazmierczak, 2024).

Socioeconomic trend	T5. Tourism as a diversification opportunity
Description	The expanding tourism sector represents a significant and widespread economic opportunity across the territories. The tourism sector is undergoing a profound transformation. While traditional accommodation is seeing a moderate post-pandemic recovery, the most dynamic growth is happening in short-stay rental platforms, which have grown vigorously in every territory analysed. This presents both opportunities for diversified local income and development and significant challenges related to housing affordability, pressure on infrastructure, and the need for sustainable tourism management.

Risks related to socioeconomic trend T5 (see D2.5 for description)

Tourism-related challenges have also been identified in several case studies.

- Case study 1 – Ría de Pontevedra: Risk M3 Environmental and social degradation from over-tourism.
- Case study 7 – Málaga: Risk C4 Public health crisis and tourism disruption from extreme heat; Risk C6 Collapse of the tourism-based economy.
- Case study 19 – Porto Santo: Risk C5 Infrastructure damage and water insecurity.

Discussion of trend T5 in the context of the associated climate change risks

Tourism remains a major economic engine in Europe and offers a credible diversification lever for European regions. However, it requires active management to generate income and jobs without increasing pressures on housing, infrastructure, and the environment. Platform-driven growth can broaden participation yet heightens resource use and climate exposure risks unless guided by circular, evidence-based destination governance (Ferrer-Roca et al., 2021; Scuttari et al., 2023; Strippoli et al., 2024).

Overtourism can rapidly degrade natural and cultural assets, undermining the very value proposition of diversification unless destinations implement capacity management, spatial and temporal redistribution, and product diversification grounded in science-policy observatories. Housing pressures associated with short-stay rentals call for coordinated rules, data-sharing, and community participation so that visitor accommodation growth does not crowd out residents or key workers essential to local services. Heat and climate shocks intensify operational risks and health burdens, making seasonal diversification, microclimate design, and risk communication core to destination resilience planning in Europe's warming context. Infrastructure and resource stress can be mitigated by circular strategies across water, energy, food, and materials, supported by certifications and procurement that shift business models toward reduce-reuse-recover pathways. Governance gaps can be closed through participatory mechanisms that embed resident voice, shared metrics, and adaptive management in destination organisations to sustain legitimacy and responsiveness over time (Ferrer-Roca et al., 2021; Scuttari et al., 2023; Strippoli et al., 2024).

Socioeconomic trend	T6. Shifting energy demands
Description	In line with the general European trend, an analysis of heating and cooling degree days—proxies for energy demand—reveals a volatile but consistent increase in the need for cooling (hot days) and a steady reduction in the need for heating (cold days). These trends directly link changing temperature patterns to energy infrastructure and consumption, highlighting an emerging challenge for the territories.

Risks related to socioeconomic trend T6 (see D2.5 for description)

The following risk is related to this trend:

- Case study 7 – Málaga: Risk C4 Public health crisis and tourism disruption from extreme heat.

Discussion of trend T6 in the context of the associated climate change risk

Europe's shifting energy demands are characterised by rising cooling needs and declining heating needs. These shifts have implications for grids, buildings, and seasonal peak management, and they heighten exposure to extreme-heat health risks and potential disruption if not proactively managed. Evidence from multiple European analyses and datasets shows a shortening heating season, a lengthening cooling season, and an overall shift toward warmer degree-day categories across southern and central regions, reinforcing the urgency of climate-aligned energy and risk planning (Lin et al., 2022). Temperature-related mortality is projected to rise with hotter and longer heat waves across European regions and cities. Older adults and those with chronic conditions are at the highest risk, making heat-health action plans and surge capacity critical public-health priorities. Intensifying heat also threatens destination appeal, outdoor activity safety, and working conditions on hot days (García-Leon et al., 2024).

Socioeconomic trend	T7. Economic convergence with Europe is barely happening
Description	While GDP has grown across all territories, this has not resulted in economic convergence with the European Union average in most territories. The analysis reveals a concerning trend where territories with lower GDP per capita are not closing the gap. Furthermore, many mid-tier territories have seen their relative economic standing decline, and only the most affluent regions have maintained their advantage. This indicates that regional economic disparities are not diminishing, and existing development pathways are failing to foster greater equity and European convergence—one of the major historical goals of the European Union.

Risks related to socioeconomic trend T7

No risk directly addressed trend T7. However, the economic activity-related risk linked to trends T1 and T2 are indirectly related to this trend.

Discussion of trend T7

Until 2008, the EU had been successful at economic convergence, as disparities among EU regions were significantly decreasing. Since the 2008 crisis, the subsequent political and economic changes have impacted economic and social cohesion (Monfort, 2020). Since then, economic convergence with the EU average has stalled because growth has been unevenly distributed across regions, with mid-tier and poorer territories failing to close the gap while affluent regions sustain their lead. Structural polarisation in productivity, export specialisations, and sectoral capabilities undercuts catch-up dynamics, reinforcing persistent core-periphery patterns despite overall GDP growth (Gräbner et al., 2020; Miron et al., 2022; Zeli & Truglia, 2025). Furthermore, the stalling of economic convergence has been identified as a main cause of the lack of popular support for the European Union (Monfort, 2020).

Recent analyses at the euro-area and NUTS-level scales identify divergent regional trajectories, indicating that the long-standing EU objective of real convergence remains only partially achieved and spatially selective. Evidence on real convergence shows that while some national averages have improved, regional disparities endure or widen inside countries, pointing to the limits of current development pathways. Cohesion and recovery instruments can support convergence only when coupled with reforms that lift technological capabilities, governance quality, and absorptive capacity, linking investment to measurable productivity upgrades and market access (Gräbner et al., 2020; Miron et al., 2022; Zeli & Truglia, 2025).

Climate change tends to widen regional disparities within Europe by imposing larger and more persistent economic damages on already vulnerable coastal, southern, and carbon-intensive regions, which can hinder convergence. Climate shocks trigger sectoral reallocation that amplifies regional asymmetries (Adam & Drakos, 2022; Arbués et al., 2024).

Annexe 1: R code for the data collection and curation

```

# LOAD GENERAL R PACKAGES GENERAL
library(tidyverse) # loads dplyr, ggplot2, ...
library(knitr)

# LOAD SPECIFIC PACKAGES TO WORK WITH EUROSTAT
library(eurostat)
library(regions)

#### QUERY DEFINITION ####
# Select the NUTS regions for gathering data
farclimate_nuts <- c("EU27_2020", "EU28",
  "ES111", "ES114",
  "ES615", "ES618",
  "PT16J", "PT196",
  "ITC11", "IT111",
  "PL913",
  "ES617", "ES612",
  "ES41", "SI042", "AL035",
  "ITG14", "ITG11",
  "ES21", "EL653", "ITF51",
  "FI1DB", "FI1D2",
  "PT300",
  "ITH20", "ITH10",
  "ITH56", "ITH57", "ITH58", "ITH59",
  "ITF11", "RO226")

# Set up global filters common to all/most databases for database query
# sinceTimePeriod sets the year since which collect data
global_filters <- list(geo = farclimate_nuts,
  sinceTimePeriod = 2016)

# List of databases to query with their specific filters
dbs_selected <- list(demo_r_d3dens = list(name = "demo_r_d3dens"),
  demo_r_find3 = list(name = "demo_r_find3",
    filters = list(indic_de = "TOTFERRT",
      unit = "NR")),
  demo_r_pjanaggr3 = list(name = "demo_r_pjanaggr3",
    filters = list(age = "Y15-64",
      sex = "T")),
  demo_r_pjanind3 = list(name = "demo_r_pjanind3",
    filters = list(indic_de = c("MEDAGEPOP",
      "PC_Y0_19",
      "PC_Y65_MAX"))),
  demo_r_gind3 = list(name = "demo_r_gind3",
    filters = list(indic_de = c("CNMIGRATRT",
      "NATGROWRT",
      "JAN",
      "GROWRT"))),
  nama_10r_3gdp = list(name = "nama_10r_3gdp",
    filters = list(unit = c("MIO_EUR",
      "EUR_HAB",
      "EUR_HAB_EU27_2020",
      "MIO_PPS_EU27_2020",
      "PPS_EU27_2020_HAB",
      "PPS_HAB_EU27_2020"))),
  nama_10r_3gva = list(name = "nama_10r_3gva",
    filters = list(nace_r2 = c("TOTAL",
      "A"),
      unit = "CP_MEUR")),
  nama_10r_3empers = list(name = "nama_10r_3empers",
    filters = list(wstatus = "EMP",
      nace_r2 = c("TOTAL",
        "A"),
      unit = "THS")),
  bd_hgnace_r = list(name = "bd_hgnace_r",
    filters = list(nace_r2 = "B-S_X_O_S94")),
  bd_hgnace2_r3 = list(name = "bd_hgnace2_r3",
    filters = list(nace_r2 = "B-S_X_K642")),
  tour_occ_nin3 = list(name = "tour_occ_nin3",
    filters = list(nace_r2 = "I551-I553",

```

```

unit = c("NR",
         "P_THAB",
         "PCH_PRE"))),

tour_ce_oan3 = list(name = "tour_ce_oan3"),
road_go_na_r13g = list(name = "road_go_na_r13g",
                        filters = list(nst07 = c("TOTAL",
                                                "GT01",
                                                "GT04",
                                                "GT06"))),

road_go_na_ru3g = list(name = "road_go_na_ru3g",
                        filters = list(nst07 = c("TOTAL",
                                                "GT01",
                                                "GT04",
                                                "GT06"))),

nrg_chddr2_a = list(name = "nrg_chddr2_a")
)

dbs_categories <- c("dem" = "demography",
                  "nam" = "economic accounts",
                  "bd_" = "business demography",
                  "tou" = "tourism",
                  "roa" = "transport",
                  "nrg" = "energy")

#### QUERY EUROSTAT ####
# The time format is 'num' for importing it as an integer
# If you want time in a data format see help of function get_eurostat_data

dbs_query <- lapply(dbs_selected, function(x) {
  filters_combined <- if (!is.null(x$filters)) append(global_filters, x$filters)
  else global_filters
  table1 <- get_eurostat(x$name,
                        filters = filters_combined,
                        type = "both",
                        time_format = "num")
  table2 <- get_eurostat(x$name,
                        filters = filters_combined,
                        type = "code",
                        time_format = "num")
  add_column(table1,
             category = dbs_categories[substr(x$name, 1, 3)],
             dataset = label_eurostat_tables(x$name),
             geo2 = table2$geo,
             .before = TRUE)
})

#### CREATION OF A TABLE FOR EACH NUTS REGION ####
# It creates one table that follows the tidy data requirements
# with observations in different years in different rows.
# This table is recommended for performing statistical analysis.
# It also creates other table "wide_data",
# with a column with all observations for a given year.
# This table is recommended for visualization.
dbs_by_nuts <- bind_rows(dbs_query) %>% nest(.by = geo)
dbs_by_nuts <- dbs_by_nuts %>%
  mutate(wide_data = map(data, ~ pivot_wider(.x,
                                             names_from = time,
                                             values_from = values)))

#### CREATION OF A GLOBAL TABLE ####
dbs_all <- bind_rows(dbs_by_nuts[[3]])

#### EXPORTING THE GLOBAL TABLE TO A CSV FILE ####
# It is recommended to export first from R in a csv file
# and later create and edit a filtered table in excel
# and save it as an .xls, .ods, or .xlsx format
write.csv(dbs_all, "table_all_nuts.csv")

```

Annexe 2: Example of the table with indicators produced for each territory analysed

NUTS 3: ES114 "Pontevedra" (NUTS 1999 onwards)

Case studies: Case study 1 – Ría de Arousa (1st wave, Spain); Case study 2 – Ría de Pontevedra (1st wave, Spain).

Source: Eurostat. Regional statistics by NUTS classification (reg).
<https://ec.europa.eu/eurostat/web/main/data/database>

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
demography	Population density by NUTS 3 region	Persons per square kilometre	211.60	211.10	210.80	211.20	211.20	211.50	212.00	212.30	
demography	Fertility indicators by NUTS 3 region	Number. Total fertility rate	1.11	1.15	1.04	1.05	1.03	1.01	1.00	0.96	
demography	Population on 1 January by broad age group, sex and NUTS 3 region	Number. Total. From 15 to 64 years	619,587.00	616,061.00	611,881.00	610,421.00	611,401.00	610,319.00	608,196.00	608,578.00	608,812.00
demography	Population structure indicators by NUTS 3 region	Year. Median age of population	44.60	45.10	45.60	46.10	46.60	47.10	47.60	48.00	48.40
demography	Population structure indicators by NUTS 3 region	Percentage. Proportion of population aged 0-19 years	17.40	17.30	17.30	17.30	17.10	16.90	16.70	16.60	16.30
demography	Population structure indicators by NUTS 3 region	Percentage. Proportion of population aged 65 years and more	21.30	21.70	22.10	22.50	22.80	23.20	23.60	23.90	24.30
demography	Population change - Demographic balance and crude rates at regional level (NUTS 3)	Crude rate of net migration plus statistical adjustment	0.80	1.00	4.10	7.10	4.50	3.50	7.20	6.50	
demography	Population change - Demographic balance and crude rates at regional level (NUTS 3)	Crude rate of total population change	-1.80	-1.70	0.40	3.50	0.10	-1.20	1.60	1.20	
demography	Population change - Demographic balance and crude rates at regional level (NUTS 3)	Population on 1 January - total	945,852.00	944,116.00	942,556.00	942,944.00	946,213.00	946,311.00	945,198.00	946,710.00	947,869.00
demography	Population change - Demographic balance and crude rates at regional level (NUTS 3)	Crude rate of natural change of population	-2.60	-2.70	-3.70	-3.60	-4.40	-4.70	-5.60	-5.30	
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Million euro	19,322.20	20,556.30	20,883.40	21,720.80	20,140.30	21,957.50	23,813.80		
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Euro per inhabitant	20,500.00	21,800.00	22,200.00	23,000.00	21,300.00	23,300.00	25,200.00		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Euro per inhabitant in percentage of the EU27 (from 2020) average	72.00	74.00	73.00	73.00	70.00	70.00	70.00		
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Million purchasing power standards (PPS, EU27 from 2020)	20,886.38	22,382.44	22,412.76	23,381.49	21,219.86	23,800.65	26,208.44		
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Purchasing power standard (PPS, EU27 from 2020), per inhabitant	22,100.00	23,800.00	23,800.00	24,800.00	22,400.00	25,200.00	27,700.00		
economic accounts	Gross domestic product (GDP) at current market prices by NUTS 3 region	Purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average	78.00	81.00	78.00	78.00	74.00	76.00	77.00		
economic accounts	Gross value added at basic prices by NUTS 3 region	Current prices, million euro. Total - all NACE activities	17,511.70	18,613.10	18,880.40	19,681.80	18,359.50	19,880.20	21,713.50		
economic accounts	Gross value added at basic prices by NUTS 3 region	Current prices, million euro. Agriculture, forestry and fishing	938.00	1,010.30	838.10	864.80	695.80	733.10	661.50		
economic accounts	Employment (thousand persons) by NUTS 3 region	Thousand. Total - all NACE activities. Employed persons	360.80	370.50	376.40	386.50	370.60	375.30	387.10		
economic accounts	Employment (thousand persons) by NUTS 3 region	Thousand. Agriculture, forestry and fishing. Employed persons	24.20	23.20	22.30	21.20	20.00	20.50	21.50		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Enterprises - number						69,133.00	70,019.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Enterprise births - number						5,620.00	5,296.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Size of newly born enterprises - persons employed in newly born enterprises divided by enterprise births - average number						1.34	1.24		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employment in enterprise deaths - persons employed in enterprise deaths divided by enterprise deaths - average number					1.47	1.37	1.36		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Enterprise deaths - number					6,037.00	4,580.00	5,315.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Size of 3 year old enterprises - persons employed in enterprises newly born 3 years back and survived divided by the same enterprises - average number						1.89	1.92		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Enterprise survivals (3-calendar year survival only) - number						4,043.00	3,723.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). 3 years old survived enterprisesâ€™ share of the business population - percentage						5.85	5.32		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Survival rate - 3 years old enterprise survivals divided by enterprise births three years ago - percentage									
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). High-growth enterprises measured in employment - number						255.00	244.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Share of high growth enterprises, measured in employment - high growth enterprises divided by active enterprises with at least 10 employees - percentage						8.45	7.85		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Business churn - birth and death rate - percentage						14.75	15.15		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Birth rate - enterprise births divided by active enterprises - percentage						8.13	7.56		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Death rate - enterprise deaths divided by active enterprises - percentage						6.62	7.59		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Net business population growth - percentage							1.28		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Persons employed - number						255,351.00	246,837.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Persons employed in newly born enterprises - number						7,519.00	6,574.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employment share of enterprise births - persons employed in newly born enterprises divided by persons employed in active enterprises - percentage						2.94	2.66		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Persons employed in enterprise deaths - number					8,886.00	6,281.00	7,242.00		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Persons employed in enterprises survivals (3-calendar year survival only) - number						7,652.00	7,155.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Persons employed in enterprises survivals, in the year of birth (3-calendar year survival only) - number						5,769.00	5,341.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employment share of enterprise deaths - persons employed in enterprise deaths divided by persons employed in active enterprises - percentage						2.46	2.93		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employment share of 3-year-old enterprises - persons employed in enterprises newly born 3 years back and survived, divided by persons employed in the population of active enterprises - percentage						3.00	2.90		

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). 3 years old survived enterprises employment growth rate - persons employed in enterprise 3 years survivals divided by persons employed in the same enterprises in the year of birth - percentage						32.64	33.96		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employees - number						204,328.00	195,889.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employees in newly born enterprises - number						2,528.00	1,892.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). Employees in enterprise deaths - number					3,434.00	2,251.00	2,552.00		
business demography	Business demography and high growth enterprises by NACE Rev. 2 activity and NUTS 3 region	Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations). New enterprise paid employment rate - employees in newly born enterprises divided by persons employed in newly born enterprises - percentage						33.62	28.78		
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country					1,872,444.00	3,065,529.00	3,739,587.00	3,772,229.00	3,747,226.00

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country									
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Domestic country						63.72	21.99	0.87	-0.66
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country					183,839.00	427,957.00	954,146.00	1,165,147.00	1,209,774.00
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country									
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Foreign country						132.79	122.95	22.11	3.83
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Number. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total					2,056,283.00	3,493,486.00	4,693,733.00	4,937,376.00	4,957,000.00
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Per thousand inhabitants. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total									
tourism	Nights spent at tourist accommodation establishments by NUTS 3 region (from 2020 onwards)	Percentage change on previous period. Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks. Total						69.89	34.36	5.19	0.40

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
tourism	Guest nights spent at short-stay accommodation offered via collaborative economy platforms by NUTS 3 region - experimental statistics	Number. Domestic country. Nights spent			496,157.00	708,641.00	557,890.00	884,059.00	1,185,671.00	1,430,669.00	1,736,843.00
tourism	Guest nights spent at short-stay accommodation offered via collaborative economy platforms by NUTS 3 region - experimental statistics	Number. Foreign country. Nights spent			188,554.00	255,417.00	55,447.00	127,213.00	383,598.00	554,608.00	672,121.00
tourism	Guest nights spent at short-stay accommodation offered via collaborative economy platforms by NUTS 3 region - experimental statistics	Number. Total. Nights spent			684,711.00	964,058.00	613,337.00	1,011,272.00	1,569,269.00	1,985,277.00	2,408,964.00
transport	National road freight transport by region of loading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Total transported goods	21,011.00	24,237.00	23,430.00	26,577.00	29,650.00	26,193.00	23,394.00	25,389.00	27,712.00
transport	National road freight transport by region of loading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Products of agriculture, hunting, and forestry; fish and other fishing products	1,604.00	1,321.00	2,893.00	1,657.00	4,403.00	1,485.00	2,530.00	2,456.00	2,405.00
transport	National road freight transport by region of loading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Food products, beverages and tobacco	2,342.00	3,422.00	3,746.00	4,900.00	3,435.00	4,734.00	4,680.00	3,364.00	5,284.00
transport	National road freight transport by region of loading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	1,122.00	1,645.00	1,509.00	2,135.00	1,381.00	1,931.00	1,323.00	1,956.00	1,374.00
transport	National road freight transport by region of unloading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Total transported goods	24,115.00	25,598.00	24,474.00	27,434.00	31,170.00	27,370.00	24,363.00	23,902.00	27,608.00

Category	Eurostat dataset	Variable	2016	2017	2018	2019	2020	2021	2022	2023	2024
transport	National road freight transport by region of unloading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Products of agriculture, hunting, and forestry; fish and other fishing products	1,689.00	1,825.00	3,193.00	2,075.00	4,869.00	1,508.00	1,938.00	3,068.00	2,193.00
transport	National road freight transport by region of unloading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Food products, beverages and tobacco	3,422.00	4,738.00	3,846.00	4,289.00	3,844.00	4,558.00	5,213.00	3,457.00	5,041.00
transport	National road freight transport by region of unloading (NUTS 3) and type of goods (t) - annual data (from 2008 onwards)	Thousand tonnes. Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	2,556.00	2,856.00	2,388.00	3,475.00	2,565.00	2,660.00	2,029.00	1,764.00	2,261.00
energy	Cooling and heating degree days by NUTS 3 region - annual data	Number. Heating degree days	1,588.72	1,417.49	1,573.34	1,496.78	1,289.44	1,419.68	1,219.93	1,258.31	1,215.06
energy	Cooling and heating degree days by NUTS 3 region - annual data	Number. Cooling degree days	57.80	45.65	63.07	21.85	58.19	19.33	85.27	38.33	57.46

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